THE RAILWAY GAZETTE
A Journal of Management, Engineering and Operation
INCORPORATING
Railway Engineer · TRANSPORT · The Railway News
The Railway Times · Herapath's Railway Journal · RAILWAY RECORD.
RAILWAYS ILLUSTRATED · ESTABLISHED 1835 · RAILWAY OFFICIAL GAZETTE

33, TOTHILL STREET, WESTMINSTER, LONDON, S.W.1.
*Telephone: WHItehall 9233 (12 lines)* *Telegrams: "Trazette Parl, London"*

BRANCH OFFICES
GLASGOW: 87, Union Street. . . . . *Central 4646*
NEWCASTLE-ON-TYNE: 21, Mosley Street . . *Newcastle-on-Tyne 22239*
MANCHESTER: Century House, St. Peter's Square . . . *Central 3101*
BIRMINGHAM: 90, Hagley Road, Edgbaston . . . *Edgbaston 2466*
LEEDS: 70, Albion Street . . . . . *Leeds 27174*

Annual subscription £4 10s. 0d. post free. Single copies, Two shillings
Registered at the G.P.O. as a newspaper. Entered as second-class matter in U.S.A.

Vol. 96] FRIDAY, JANUARY 18, 1952 [No. 3

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### Absenteeism

THE manpower position on British Railways has been for many months far from satisfactory, more particularly in operating, civil engineer, and some workshop staff, and statistics in the past few weeks have shown the situation to be only just kept in hand as regards men on the payroll. At the moment, the effective strength is greater—in some cases considerably—than a year ago. The exceptionally mild winter so far, and freedom from epidemics have reduced absence through sickness. Absenteeism generally has been reduced, though the situation differs in different areas. This seems to be the case generally with all branches of nationalised transport, including British Road Services, where the nature of the work increases the temptation to be absent and the difficulty in enforcing discipline. In contrast with this is the still high degree of absenteeism in the coal mines; although the situation there improved—as it usually does—in the weeks before Christmas, absenteeism still is rife, and the miners' sensitiveness on the subject has resulted in their recent refusal to permit publication of absenteeism figures unless this is done for other industries also. The labour situation on the railways, however, is very different from that in the mines. Although railway work often is arduous and done in unpleasant weather and other conditions, it is in the main less arduous and dangerous than mining. Staff relations on the railways, despite disputes in the past, have lacked the bitterness that has had lasting effects on the mining industry. The nature of railway work, its hours, and method and amount of pay, offer less temptation to the irresponsible—who fortunately are few among railwaymen. Much has been achieved by the efforts of railway officers and representatives of the unions, through the consultative machinery, and less, perhaps, through the Special Joint Committee set up last March to seek economies in manpower. The increase in the available labour force on the railways is reflected in the increased traffics handled in recent weeks, mentioned below, and also in the recent restoration by some Regions of passenger trains suspended in October last to release train crews for goods traffic; but it would be unfair not to give credit to the men of many grades who made the extra effort which so far has brought success: it is not merely a question of numbers, but of the quality of the work of the men concerned.

### Coal and Freight Traffic Records

THE record lift of coal by rail from deep-mined pits and and opencast sites, some 463,560 tons or 46,356 wagons, during the 48 hr. ended 6 a.m. on December 17, 1951, was referred to in our December 21 issue. The Railway Executive announces further achievements in freight traffic in December. The proportion of wagons out of service under or awaiting repair on December 22 was 6·28 per cent., the lowest since 1939, and an improvement on the percentage (6·8) for the four weeks to December 2. During the latter period, the total net ton-mileage of freight conveyed was 1,894,959, the highest recorded since March, 1945, and only 1·5 per cent. below the corresponding average in 1942-44, and the highest recorded in peacetime since the four-weekly statistics were introduced in January, 1931. These figures confirm that the winter freight traffic situation was well in hand with the winter half over, as we suggested in a recent editorial article. There remains, however, the probability of more severe weather in the latter half of the winter. Commenting on this, "The Man on the Line" states in the current issue of the *British Railways Magazine* that "we could not have achieved what we have unless this winter's rail transport had been planned well in advance." Should bad weather come, he adds, British Railways are better prepared with more resources than ever before for dealing with it, both in colour-light signalling and track circuiting, and in anti-freeze equipment.

### F.B.I. and Steel Allocations

THE recent steel allocations by the Ministry of Supply were discussed in an editorial article last week; we commented on the irrelevance of the factors considered by the Ministry in allotting the steel, especially for the locomotive building industry, which is of such great importance in British export trade. This irrelevance was referred to, last Friday, by Sir Archibald Forbes, President of the Federation of British Industries, at its annual general meeting in Glasgow; whilst the plain fact of the insufficiency of steel must be recognised, he said, the initial allocations might have been based on obsolete information and might not have given full weight to the relative importance of certain products and markets. Efforts were being made through the various trade associations and principal consumers of steel to gain information on the effect of the allocations and so to consider making representations for readjustment. Of the general trend of the steel allocations—which does not seem to be reflected in the railway materials industries—Sir Archibald Forbes pointed out that the Government might have been activated by a wish to increase the export of capital goods at the expense of the development of domestic industry. The long-term effect of this, he added, would be serious, as national prosperity depended on increasing total output and maintaining industrial ability to compete.

### Complementary Rail and Road Transport

THE pioneer activities of the railways in developing road transport for collection and delivery of rail-borne traffic were traced last week in a paper read to the Metropolitan Section of the Institute of Transport by Mr. A. A. Harrison, Executive Officer (Road Transport), the Railway Executive; N.E.R. road transport powers date back to 1871, and the N.E.R. introduced steam wagons for cartage service in 1904. He outlines the beginnings of throughout

road services operated by the L.N.E.R. for traffic which could not be satisfactorily handled by a mixture of rail and road service, and the provision of road transport in connection with rail for less-than-wagonload traffic. Mr. Harrison shows how the subsequent pressure of road competition caused extension of direct cartage services, supplemented by association with railway-owned or partly-owned road transport undertakings. He describes the zonal system of C. & D. and the rationalisation of "smalls" and parcels handling by the B.T.C., with the growing use by British Road Services of rail for the trunk haul—and trunking by road in some cross-country services. He also illustrates the possibilities of complementary use of rail and road in wagonload traffic in the movement of perishables by the L.N.E.R. in 1946. He comments on the disadvantages of centralising freight traffic on a few stations, of transhipment, of wagon transporters, and of road trailers on wagons. A simpler division of function may be the solution, he suggests, based on mileage limits varying with the class of traffic and other circumstances. Progress in these matters, Mr. Harrison points out, is delayed by the staff problem and the inadequacy of many goods stations; but much has been achieved—as in the closing of unremunerative branch lines.

## Transport and Tourism

THAT transport is the largest component of the tourist industry with the greatest contribution to make and the greatest benefit to derive was one of the main theses of the recent paper on "Transport and the Tourist Industry" read to the Institute of Transport by Mr. E. L. Taylor, Deputy Chairman of the British Travel & Holidays Association and an Executive of the British Electric Traction Co. Ltd. He pointed out that of the £70 million spent in Britain by visitors from abroad in 1951, some £14 million, or 20 per cent., was spent on internal transport. The urge to travel has overcome political obstacles such as currency regulations; the gratification of it, however, depends on a financial margin over subsistence level, so that the market is sensitive to cost of money, time, and convenience. Among the component industries in tourism, he added, providers of transport on the international routes must maintain an intensive study of current conditions so as to ensure proper use of their expensive equipment, and here there is the keenest appreciation of tourist values; the providers of internal transport will have a fair understanding of the issues involved because they depend on marginal demand and often are linked with international transport interests.

## Railroads in the U.S.A.

IN September and October, 1950, the Organisation for European Economic Co-operation sent a party of 82 officers, experienced in various aspects of railway operation and equipment, to study technical and economic features of the U.S.A. railways. It was expected that the mission would draw useful comparisons between European and American practices and that its enquiries might help forward European co-operation in railway and transport developments. Judging by the mission's report, which O.E.E.C. published recently, the organisers of the tour were optimistic. A review of the report appears on another page in this issue. Most of its recommendations are indefinite and will not lead to early action. The best hope is that the mission's studies will start fresh lines of thought about transport relations between European countries interested in the International Union of Railways.

## Port Eglinton Signalbox

THE signalbox at Port Eglinton, Glasgow, on the former Glasgow & South Western Railway, controls the junction of two routes from Paisley into St. Enoch terminus, goods lines, and depot and carriage siding connections. There are heavy passenger traffic, empty stock and light engine movements, and freight working mainly between Glasgow High Street and General Terminus on the dockside. As the track required renewal, it was decided to simplify the layout, by substituting for a crossing one in the reverse direction. Colour-light signalling has been installed in the section, and the former lock-and-block apparatus has been replaced by electro-mechanical locking. The first intention was to abolish Port Eglinton and another box and bring the area within the St. Enoch colour-light signalling zone, and the present scheme has been devised to allow the full project to be carried out when desired. The installation uses, for the first time, Westinghouse Brake & Signal Co. Ltd. plug-in relays.

## Indian Railways Lightweight Stock

THE multiple-unit lightweight electric rolling stock recently supplied for use on the Bombay suburban routes of the Central and Western Railways of India, described and illustrated in our issues of April 27, May 11 and 25, and June 8, 1951, formed the subject of three separate papers read before the Institution of Locomotive Engineers on January 16. The first paper, by Mr. S. E. Lord, drew a comparison from the mechanical design point of view between the earlier examples of suburban rolling stock and that recently supplied. The second paper, which was read by Mr. J. F. Tring, dealt with questions relating to the design of the rolling stock, including the methods adopted for calculating stress and deflection characteristics. The third paper, by Mr. H. C. C. Barton, gave a brief outline of the character of the Bombay suburban traffic, together with some of the operating features. This contribution also included a description of the electrical equipment, and the results in the initial trials in July and August, 1951, during which some of the multiple-units did approximately 3,000 miles of intensive test-running.

## S.R. Suburban Set with Standard Equipment

SINCE the war the older Southern Region electric suburban sets, many of which had seen substantial service before the Grouping, have steadily been replaced by new, or rebuilt units. After some variation in seating and layout in the earlier vehicles, these rebuilt sets have mostly been made up of three open and one compartment coach, and at a recent date 184 of this type had gone into service. The first of these rebuilt multiple units to carry the new Southern Region standard electrical equipment, the appearance of which was referred to in our December 28, 1951 issue, will shortly begin regular working on the Eastern Section and it is intended to continue rebuilding about 50 old sets a year for the next four, or five years. Among the features of the new sets are the buckeye automatic couplers at the outer ends of the unit, a driving cab with access from the guard's compartment and no external doors, and the provision of the Westinghouse non-interlocked electro-pneumatic brake with self-lapping controls, in addition to the Westinghouse automatic brake. Acceleration has been increased to the maximum possible within the limits of adhesion; 25 per cent. of the axles are motored.

## Plastics in Permanent Way

WHAT is claimed to be the first application of plastic materials to railway permanent way construction is the subject of an experiment now being carried out by the Erie Railroad at Cleveland, Ohio. By a cross-lamination process of glass fibre with a plastic binder, a plastic has been produced which, it is claimed, has ten times the resiliency of steel as determined by Young's modulus formula. From this plastic the Dynakon Company has fabricated a number of baseplates for flat-bottom rails of the type normally rolled from mild steel. The aim is to produce a baseplate that will provide a measure of cushioning for the rail, and at the same time will have a much longer life than a steel baseplate, which suffers from corrosion, especially from that caused by drippings of brine solution from refrigerator wagons. Another advantage of the plastic baseplate is that it weighs only 3 lb. as compared with 15 lb. for a steel baseplate; in the cost of handling alone the plastic product would be considerably more economical than steel.

### Steam and Electric Traction

THE factors affecting fuel consumption in steam and in conjunction with electric locomotives, and their respective power outputs, are discussed elsewhere this week in an article by Mr. J. L. Koffman. He considers the term "efficiency," and deals with different manifestations of it in the steam locomotive and in the power station, sub-station, transmission, and electric locomotive. The evidence he assembles is weighty in favour of his conclusion on the much greater efficiency—according to his definition of that term—of electric traction with fuel-generated power. That, however, is only one factor of many in comparing steam with electric traction. The high capital cost of the fixed installations, for instance, and that of electric compared with steam locomotives, militate against electrification of steam-worked lines except where there have been present special factors such as high actual or anticipated density of traffic, cheap water power, or heavy gradients, or combinations of these. The relative simplicity and ease of maintenance of the steam locomotive also is in its favour, both in highly developed countries with a plentiful coal supply and on railways existing or to be built in tropical and other territories due for economic development.

## Railway Salary Anomalies

DETAILS were given in last week's issue of the salary increase for the whole of the non-industrial Civil Service which takes effect from January 1, 1952. The amount of the increases taper down from 10 per cent. at the lowest level of £500 a year, to some 5·8 per cent., on £1,500 a year, assessed on percentages diminishing progressively on each part of the salary. The salient point of the Civil Service award is its basis on the percentage increase in the index of wage rates since January 1, 1951, which was some 10 per cent. by the end of November last. The increase was not based on the rise in the cost of living, the more usual basis of wage increases. It is in marked contrast to the salary increases from January 1, 1951, for heads of departments of the London County Council. Those affected range from the Children's Officer, whose salary before increase was £2,000 a year, right up to the Clerk of the Council at £3,750, and the increase was approximately a flat 10 per cent. The basis of this advance is the same as for the increases granted to subordinate staff who were covered by the Joint Committee of Members & Staff, those with salaries under £1,200 a year. The increase in the salaries of heads of departments is without prejudice to a further consideration of their remuneration in the light of their responsibilities. A further pay increase is believed to be under consideration for L.C.C. staff, but this may not be on a uniform percentage basis. What emerges, however, is the uniformity in the advance in salary right through from heads of departments, and within that category, to lower grades.

An editorial article in our issue of December 7 discussed the salaries of senior railway officers and drew attention to the paucity of the remuneration for the heaviest burden of responsibilities. The increase for senior officers, backdated to August last, was the first for a considerable period, as against the intermediate group of junior officers and senior clerical and supervisory staff who had received "consequential" increases in January, 1951. Senior officers with a basic salary range of £1,600-£3,500 a year received bonuses standard for three salary groups within this range; these amounted on a percentage basis to an increase tapering down from 11 at the lower to some 7 per cent. at the upper end of the range. What is anomalous is that the salaries of those receiving £3,500 a year and upwards are, we understand, to be on a merit basis. The number of railway officers in this class is small—only about 100 officers paid such salaries are employed by the whole of the British Transport Commission and its Executives. On British Railways, these are mostly former Chief Officers of the main-line companies whose salaries are at the higher levels obtaining before nationalisation.

The failure to include the most senior railwaymen in the increase in salaries accorded to their subordinates is invidious. To put them thus in a special class implies that there is something abnormal in earning a salary of £3,500 a year or more, surely far from an extravagant figure in view of the responsibilities involved. Naturally this has discouraged those singled out for such treatment, not the least because they are unable to voice their feelings.

To underpay those with the heaviest responsibilities in an undertaking such as British Railways, and not only to underpay, but also to withhold from them the small increase in remuneration accorded to their juniors, cannot make for efficiency, despite the unswerving loyalty and devotion of those affected. Efforts have been made in the past few months to increase the pay incentives for lower grades of British Railways employees, but such additional incentives should be shared fairly by all ranks, as the London County Council has realised. The highest paid railway officers are not less affected than their juniors by the fall in the purchasing power of money, and taxation weighs as heavily, or more heavily, on them. With the reduction since nationalisation in the number of highly paid positions on railways in this country, there has been, as we have pointed out more than once, a reduction in the attractions offered by the railway service to the able and ambitious, and there has also been a drain of able men to employment in other walks of life as well as to railways overseas. In our opinion, the recent failure adequately to reward high officers is psychologically unsound as regards the morale of existing railwaymen. Dissatisfaction and discouragement at the top can hardly fail to spread downwards, and this is in no way the result of any conscious action on the part of the leaders, who are not easily discouraged, and are not given to grumbling in such matters. There is another point arising from recent salary advances which has been unfortunate in its reaction—the absorption of "merit" increases in the backdated, more general adjustments. This again appears to reflect a lack of understanding of human reaction to what is considered a cheeseparing policy. The effect on the staff morale is out of all proportion to the monetary economy effected.

## The Road-Rail Freight Problem

IN view of the changes now foreshadowed in the road transport industry, a recent paper, entitled "An Historical Analysis of the Road-Rail Freight Problem," presented to the Scottish Section of the Institute of Transport by Mr. G. W. Quick Smith, Secretary & Legal Adviser to the Road Haulage Executive, is of especial interest. It includes valuable documentation of the salient points in the various steps taken by successive Commissions, Acts, Conferences, Advisory Councils and Committees towards the regulation and co-ordination of both forms of transport during the past quarter-century. The ultimate aim in all cases has been complete co-ordination, so as to provide the best possible service for the least real cost to the community as a whole.

Outlining the problem, Mr. Quick Smith points out the four handicaps from which the railways suffered: unfair competition by road operators in the form of inadequate staff remuneration, overloading of vehicles, and so on; the obligation of the railways to build and maintain their own track; the fact that the railway rates structure "was not designed for operation in a competitive world" and the statutory obligations of the railways; and the under-utilisation of railways in relation to their high proportion of fixed costs. He distinguishes between the necessity to secure the survival and financial stability of the railways, and the desirability of ensuring that the best use is made of the national railway system as a national asset. A subsidy, he states, is a reasonable suggestion simply to preserve the railways, but "has no relevance whatever to . . . making the best of existing resources."

The phrase "making the best use of existing resources" needs some clarification. The existing resources he points out, are the physical assets themselves and not the money symbols attached to them; the best use is not to be made

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of existing resources by clinging to obsolete forms of transport and suppressing new methods, one of the great dangers of nationalisation, so far avoided, but always to be kept in mind; and national resources must be deployed in the interests of the country as a whole. This may mean that some transport users are detrimentally affected, if, for example, they have to pay more because of the elimination of uneconomic competition between the different forms of transport.

The far-sightedness of the members of the 1930 Royal Commission on Transport is made clear by Mr. Quick Smith. After emphasising that the railways were indispensable and must not be scrapped or even rendered partly unremunerative, they stated that some form of unification was essential to bring about complete co-ordination of transport.

They then put forward four forms that unification might take: (1) Government ownership and operation of all transport under a political chief; (2) a merger of all existing transport agencies under a great private monopoly combine; (3) a combination of (1) and (2) to be publicly-owned but worked by private companies under licence; and (4) a public trust on the lines of the Port of London Authority or the then-contemplated London Passenger Transport Board. Although their report expressed no definite recommendation in favour of any one of these four alternatives, a preference for (4), a public trust, was clearly implied.

The Transport Act of 1947 adopted this course by establishing the British Transport Commission with the duty of providing an integrated system of public transport throughout Great Britain, except within the 25-mile limit for road haulage. The expressed aim of the Commission was to develop road and rail transport as complementary to one another; the spheres of activity of each have also been defined.

These spheres include: by rail: traffic in train loads; trunk haulage, free from staging, of most long-distance traffic, possibly with additional use of containers and feeder or distributor services by road; low-grade traffic over any distance, in train-loads or not, wherever train service is adequate and costs less than road service; traffic requiring bulk movement and storage; and large blocks involving unbalanced movement; also, by road: local transport; longer-distance traffic up to the distance beyond which economy in rail haulage for the trunk portion of the conveyance is greater than economies resulting from (1) avoidance of transhipment and consequent reduction in risk of pilferage, damage or loss, (2) saving in time, (3) special measures necessary with out-of-gauge loads, and (4) household removals.

Mr. Quick Smith points out that, although considerable progress has been made in integration, no rapid development can be expected, as it must be in the form of a series of often-small measures. One of these, which is of possible future significance ,is the East Anglian experiment, mentioned in the 1950 report of the Commission; this aims at giving a more efficient service to traders by providing a common commercial service for road and rail traffic in that area, and may foreshadow the Commission undertaking delivery, so that the trader will be indifferent to the mode of transport used.

At the moment, it is not clear how the changes under consideration in the organisation and control of road transport will fit into the co-ordination picture as a whole, but when they materialise they will have to do so. There should be general agreement with the remarks in the concluding paragraph of the paper. They express the views that neither road nor rail transport, developed jointly in the interests of trade and industry under common ownerships "should be suppressed to secure the preservation of the other; each should be 'streamlined' and where necessary adapted to meet new needs and changing circumstances; both should be lifted to the highest level of efficiency so that together they can provide services of a quality that neither could provide separately. The task is not without its difficulties . . ." The end of the many difficulties is not yet in sight, but the problem should not be insoluble.

## The Indian Railway Inspectorate

THE report for the year ended March 31, 1951, by the Chief Inspector of Railways in the Indian Ministry of Communications states that the only change in the organisation of the inspectorate during that year was the transfer of control of the Jodhpur and Bikaner State Railways from the Chief Inspector to the Inspector of the Bombay Circle, as a result of their integration in the all-India system. It points out that when the six new zones of railway administration are finally settled, the question of readjustment of jurisdiction of the various Government Inspectors will be considered.

On March 31, 1951, the route-mileage of Class I lines totalled 32,320 out of 34,025 miles in all open for traffic throughout the country. Some 97 per cent. were owned and worked by the Government of India, the remaining 3 per cent. either belonging to and operated by companies or district boards or lying in foreign territory. About 20,660 route-miles or over 60 per cent. of the total mileage were inspected by the four circle inspectors; roughly half were detailed annual inspections and half tour inspections. Also, 65½ miles of new line and 22 miles of doubling were inspected before being opened for public passenger traffic.

The number of accidents of all kinds reported to the inspectorate during the year was 12,921 (11,901), but if accidents to trespassers, railway servants not travelling in trains, and passengers falling out of trains are excluded the number was only 1,012 (851); the numbers in brackets are the corresponding figures for 1949-50. The Government Inspectors inquired into 23 (16) accidents during the year under review. Eleven were passenger train derailments, three of them due to acts of sabotage; seven were collisions involving passenger trains, one the result of train wrecking; two were fires in passenger trains; two were collisions involving railway materials trains; and one was caused by the collapse of a firebox crown-plate on a goods train.

The following are brief details of the more serious accidents:—

On April 9, 1950, the last six coaches of an up Allahabad-Bombay express were derailed on the G.I.P.R. near Dongargaon. One railway servant was killed and 43 passengers were injured. The cause could not be determined.

On April 12, the down Kumaon Express was derailed 24 ft. short of Tarara Bridge on the Oudh Tirhut Railway near Bitroi. The engine and first coach got across the bridge, but other coaches fell over the bridge. Including the fireman, 36 persons were killed, and 101 were taken to hospital. The cost of damage was nearly £33,000, and the cause was tampering with the track.

On May 7, the E.I.R. up Punjab Mail was derailed 93 ft. from the abutment of Tamakhan bridge. The engine and three coaches fell down the embankment. There were 92 deaths and 67 serious injuries, and the cost of damage was £14,000. The cause was the complete removal of one rail, and 15 persons were committed to the Sessions Court for alleged complicity in this act of sabotage.

On August 13, the engine and 12 wagons of a down goods train were derailed on a bridge near Karmnasa on the E.I.R., and the up Toofan Express collided with two derailed wagons fouling the up line. The express engine and three coaches were derailed and overturned, with the result that 29 persons were killed and 113 injured; the cost was £13,350. The initial derailment was caused by the opening of a rail joint and slewing of the end of the rail out of line. This sabotage was committed despite the fact that State Police were patrolling this section of line at the time.

On September 3, the engine of the up Kashmir Mail overturned and four coaches were derailed and telescoped near Gurdaspur, E.P.R., because of floods undermining the abutment of a bridge. A total of 12 persons was killed and 23 were grievously injured; damage amounted to about £7,500.

Abnormally heavy rains and floods caused many and long interruptions to traffic on some sections. One section

was closed for nine months and another abandoned in the Teesta River area; nearby, the Kurseong-Darjeeling section was interrupted for 293 days. Two other lines, on the O.T.R., were out of service for 171 and 151 days; five other sections in different parts of the country were inoperative for between 50 and 100 days. Minor interruptions were numerous.

## British Transport Commission Traffic Receipts

DESPITE the record coal carryings in December, British Railways receipts from coal class traffic, and also from parcels, merchandise, and minerals for Period 13, the four weeks ended December 30, were down on the previous period, mainly because of the Christmas holiday. On the other hand, mineral receipts were 21 per cent. up on Period 13 of 1950, and coal and merchandise receipts some 13 per cent. up, which represents increase in traffic in the light of the 10 per cent. rise in rates last April. British Railways passenger receipts for Period 13 were 2·5 per cent. down on 1950, for which the shorter Christmas break, and perhaps public caution in spending, were responsible.

London Transport receipts for Period 13 show a slight increase in railway and larger increase in bus receipts, the result presumably of reduced business travel at Christmas. Inland waterway receipts were well up on 1950, but there is no obvious cause for the 26·7 per cent. rise.

| — | Four weeks to December 30 | | Incr. or decr. | Aggregate for 52 weeks | | Incr. or decr. |
|---|---|---|---|---|---|---|
| | 1951 | 1950 | | 1951 | 1950 | |
| *British Railways*— | £000 | £000 | | £000 | £000 | |
| Passengers ... ... | 7,799 | 8,006 | − 207 | 106,610 | 106,484 | + 126 |
| Parcels, etc., by passenger train ... ... | 2,511 | 2,413 | + 98 | 32,950 | 30,661 | + 2,289 |
| Merchandise & livestock | 7,481 | 6,612 | + 869 | 99,193 | 88,525 | + 10,668 |
| Minerals ... ... ... | 2,990 | 2,462 | + 528 | 36,625 | 32,472 | + 4 153 |
| Coal & coke ... ... | 6,779 | 5,986 | + 793 | 90,858 | 77,685 | + 13,173 |
| | 27,560 | 25,479 | + 2,081 | 366,236 | 335,827 | + 30,409 |
| *Road Passenger Transport : Provincial & Scottish*— Buses, coaches & trolleybuses ... ... ... | 2,817 | 2,578 | + 239 | 43,007 | 38,087 | + 4,920 |
| *London Transport*— | | | | | | |
| Railways ... ... ... | 1,224 | 1,212 | + 12 | 16,045 | 14,666 | + 1,379 |
| Buses & coaches ... | 2,531 | 2,234 | + 297 | 33,664 | 30,741 | + 2,923 |
| Trolleybuses & trams ... | 688 | 760 | − 72 | 9,612 | 10,514 | − 902 |
| | 4,443 | 4,206 | + 237 | 59,321 | 55,921 | + 3,400 |
| *Inland waterways*— | | | | | | |
| Tolls ... ... ... | 64 | 54 | + 10 | 868 | 746 | + 122 |
| Freight charges, etc. ... | 78 | 58 | + 20 | 939 | 840 | + 99 |
| | 142 | 112 | + 30 | 1,807 | 1,586 | + 221 |
| Total ... ... | 34,962 | 32,375 | + 2,587 | 470,371 | 431,421 | + 38,950 |

The advance aggregate figures for 1951 show British Railways traffic receipts as £366,236,000, an increase of £30·4 million on 1950. Passenger revenue for the year was almost the same as for 1950—disappointing in view of the Festival, of increased military travel, and of the application of the London Charges Scheme from October, 1950. The £30 million additional revenue was derived mainly from coal class (£13·2 million) and merchandise (£10·6 million) traffic. Comparison of total freight receipts for 1950 and 1951 must take into account the rate increases of 16⅔ per cent. in May, 1950, and of 10 per cent. in April, 1951; the latter were expected to bring in £20 million in a full year.

Traffic receipts in the advance figures do not include road haulage. Those for railways, provincial and Scottish buses, London Transport, and inland waterways, for the year 1951 show an increase of nearly £39 million over the previous year. The £9 million increase not in respect of British Railways was accounted for by provincial buses (£4·9 million) the result largely of acquring further undertakings, and by London Transport (£3·4 million), the result of the Festival and of the London Charges Scheme. Assuming an average of £5·5 million for British Road Services for Period 13 allowing for the Christmas holiday and the suspension from November last in acquiring new undertakings, and with a corresponding average for ships, it is possible to estimate the total receipts from the principal B.T.C. carrying activities in 1951 after allowing also for certain other small factors. The total estimated is £559-£560 million against £519 million for 1950.

**PERCENTAGE VARIATION 1951 COMPARED WITH 1950**

| | 4 weeks to December 30 | 52 weeks to December 30 |
|---|---|---|
| *British Railways*— | | |
| Passengers ... ... ... ... ... | − 2·5 | + 0·1 |
| Parcels ... ... ... ... ... | + 4·0 | + 7·4 |
| Merchandise & livestock ... ... | +13·1 | +12·0 |
| Minerals ... ... ... ... ... | +21·4 | +12·7 |
| Coal & coke ... ... ... ... | +13·2 | +16·9 |
| Total ... ... ... ... ... | + 8·1 | + 9·0 |
| *Road Passenger Transport* ... ... ... ... | + 9·2 | +12·9 |
| *London Transport*— | | |
| Railways ... ... ... ... ... | + 0·9 | + 9·4 |
| Buses & coaches ... ... ... ... | +13·2 | + 9·5 |
| Trolleybuses & trams ... ... ... | − 9·4 | − 8·5 |
| Total ... ... ... ... ... | + 5·6 | + 6·0 |
| *Inland Waterways* ... ... ... ... ... | +26·7 | +13·9 |
| Aggregate ... ... ... ... | + 7·9 | + 9·0 |

## Manchester in Transport

EVEN before the railway age the name of Manchester was significant in transport. It was a road and canal centre of importance. Pre-eminent among its canals was the Duke of Bridgewater's, authorised in 1737 with the main object of supplying the city with coal. Latterly, although fast flyboats covering up to 50 miles a day plied the canals, there were transport bottlenecks which seriously hampered the trade and industry of Manchester, as Mr. C. E. R. Sherrington, Director of the Research Information Division, British Transport Commission, stated in his paper, "Manchester's Contribution to Transport," to the Manchester & District Traffic Association on November 16, 1951. Cotton, for instance, sometimes remained two weeks in Liverpool awaiting onward transport. As soon as a railway between the two cities became a practicable proposition, therefore, Manchester energetically supported the project, which was vigorously but unavailingly opposed by landowners and canal proprietors.

The Liverpool & Manchester Railway was an immediate success. In the last three months of 1830 it carried 1,433 tons of merchandise alone between the two cities, but during the first half of 1831 the tonnage was 35,865 and in the first half of 1835, 76,448. At once, lines were projected from Manchester to Birmingham, Bolton, and Leeds. The Manchester & Leeds was the first link between the Humber ports, the West Riding, and Liverpool, and was planned to carry the exports of the West Riding to Liverpool for shipment. It was a great engineering feat of which it was said that "it will redound to the credit of George Stephenson more than all his other works put together."

The famous business of Pickfords originated in the Manchester district towards the end of the 17th century, when Thomas Pickford organised packhorse trains. In 1803 the firm was operating a road service to London six days a week. Another noted carrying business inaugurated in Manchester was that of Carter Paterson, formed in 1860. Financial control of both was acquired by the railways in 1933. Manchester's aspirations to become an ocean port were realised in 1849 when the Manchester Ship Canal, which cost some £15,000,000, and can be traversed by ships of up to 12,500 tons, was opened.

The city has long been a centre of the motive power industry. The firm of Nasmyth, Wilson & Co. Ltd. no longer turns out steam locomotives, but the works of Beyer, Peacock & Co. Ltd., at Gorton, have continued to build them for almost a century. The firm of Metropolitan-Vickers Electrical Co. Ltd. exports electric traction equipment, and has lately entered a new field of railway traction, the gas turbine engine.

# LETTERS TO THE EDITOR

*(The Editor is not responsible for the opinions of correspondents)*

## Kings Cross Underground Station

January 8

SIR,—I read in your December 14 issue that the proposed Route "C" tube linking Tottenham with Victoria will not have cross-platform interchange at Kings Cross with any of the other three London Transport lines.

Both the advent of the new tube and the non-interchange of the platforms at Kings Cross will make good reading to my successors. The proposed tube has been long overdue, and the merging of the Piccadilly, Northern, and Metropolitan Line stations at Kings Cross into one station, with little or no widening of the approach passages, was a major tragedy, as anyone who uses the station just after 5.30 p.m. on a weekday can testify.

Yours faithfully,

HERBERT W. CECIL

8, Powis Grove, Brighton, 1

## Southern Region Diesel-Electric Locomotives

January 8

SIR,—The answer to the first point in Mr. J. B. Latham's letter in your December 7, 1951, issue is that the diesel-electric locomotive saves approximately 6¼d. per mile over a steam locomotive, in fuel costs alone.

With this type of locomotive there are no standby losses, and time does not have to be wasted at stations between terminal points for taking water. Again, the ability of this diesel locomotive to run non-stop between Waterloo and Exeter Central is a facility not yet realised with steam traction on the Southern Region.

Mr. Latham's statement concerning this type of locomotive requiring assistance west of Salisbury during heavy summer traffic is puzzling. So far, No. 10202 has shown itself equal to anything a "West Country" can tackle, and has even surpassed the work of those locomotives in many cases.

The full advantages of diesel availability will never be realised in this country while these locomotives are built in uneconomical numbers, namely, two or three only at one time. It is necessary under these conditions to run to steam schedules, whereas if a suitable number was put into traffic the timetables could be modified accordingly.

Yours faithfully,

A. J. HAMMOND

24, Herne Road, Surbiton

## An Appeal to Sanity

December 4

SIR,—At times readers have expressed how important reasonable and fair discipline is to the making of an efficient railway system. Many might say that such elementary truths need no expressing. When the creaking disciplinary machinery at divisional headquarters begins to operate, the order of the day is "let's take the line of least resistance—it pays today," and so this lethargic spirit creeps down from the top to the bottom. Those who have to operate the local disciplinary machinery become infected; the rank and file who have pride in their job also contract it and the new entrants assume that this is how the railways have always been administered.

This gradual deterioration of an essential part of the railway system has left an indelible mark in every corner of the industry. To write of incidents seen is to reiterate our daily Press which glories in finding fault with a nationalised industry or aids the dissatisfied customer who thinks that all public services should be entirely for his benefit. Surely the criterion of weak and misjudged leadership in disciplinary matters can be quoted in this journal, if only as an appeal to sanity.

A fireman working on his rest day at enhanced rate of pay refused travel as passenger to work a train from a depot where men were not working on their rest day. He refused on the grounds that he would be "blacklegging" the men of that depot. The fact seems not to have been considered that he was going to the starting point of a train where staff shortage was so acute that if men from other depots did not assist the train would not depart. The local management paid the man up to the time of refusing duty, but the divisional superintendent thought otherwise. The man was in due course paid for normal time.

I trust that when Mr. Elliot again appeals for co-operation he will also appeal for sanity at all levels.

Yours faithfully,

A. E. GRIGG

85, Larch Grove, Bletchley, Bucks

## Improving the Riding of Coaches

December 22

SIR,—As the passenger alone is said to pay on the railways these days, there seems to be every reason for treating him well. Possibly this is why the S.N.C.F. is experimenting with American bogies, to give him a smoother ride.

Are any similar experiments being made in this country? Our main-line rolling stock is good, but it does not seem noticeably better than it was many years ago. The most comfortable ride I can recall was in a Swiss train two or three years ago. This was appreciably quieter and steadier than anything I had then experienced, and the train certainly did move!

Most of my travelling is on London electric suburban railways, where the wheels grind and the coaches rattle and bump until it is almost impossible to read, even in post-war stock. Surely a smooth running bogie could be produced, even if it does contain a motor. It might be possible to include some sort of automatic lubrication so that those doleful grunts and groans would never be heard again.

Yours faithfully,

G. A. HARMER

3, Veronique Gardens, Ilford

## A Criticism of American Diesel Power

December 31

SIR,—Writing as a keen observer of railway motive power, I was quite interested to read Mr. J. B. Latham's remarks on the Southern Region diesel locomotive in your December 7 issue. May I suggest that you give room to some pertinent criticism of North American diesel locomotives. Unfortunately our own U.S. technical press is reluctant to permit the venting of justified diesel locomotive criticisms.

Mr. Latham states "It is difficult to see how it (the diesel) can effect any economy over the steam locomotive. . . ." There are many thousands of Americans and Canadians who would vigorously echo Mr. Latham's sentiments. Let me therefore give your readers, who I hope include also top U.S. and Canadian rail officials who cannot be reached otherwise, Mr. John Q. Public's own views of diesel locomotives.

The once good record of punctuality of our railroads in the steam era is now at an all-time low ebb. Crack trains, such as the New York Central "Twentieth Century Limited" slink shamefully four to six hours late into Grand Central Terminal. A few days ago, the Missouri Pacific's pride, the "Colorado Eagle," on its Denver to St. Louis journey, arrived at destination six hours late. In this instance there were two diesel breakdowns during the

night and the last leg of the trip was completed by a gallant oil-burning Pacific, which highballed the 12 cars in grand style, in sharp contrast to the "lame duck" two-cab diesel performance.

Probably as the result of the nose-suspended electric traction motor action and small driving wheels, without the mitigating effect of the leading, lightly-loaded bogies of steam power, the tracks of the dieselised North American carriers appear to deteriorate rapidly. The New York Central's once widely-advertised "Water Level Route," offering its patrons a smooth ride, is now a shabby sight. To ride nowadays in a "Twentieth Century" sleeper is an ordeal, and it is little wonder that air liners carry more and more passengers every year. The acrobatic antics of a modern sleeping car travelling at 85 m.p.h. over a diesel exposed track is something one has to experience to appreciate the smooth comfort of air travel. It is not surprising to see the New York Central and other roads being compelled to lower the speed limit from 85 m.p.h. to 75 m.p.h., when such rough riding of trains is experienced since the advent of diesel power.

The heating problem of diesel-power passenger trains is as bad as ever. Before the Christmas rush, the Pennsylvania alone is reported as having had to send some 80 sleeping cars to the car shops in Wilmington, where crews got the three-shift job of thawing out the frozen heating and water pipes. Sleeping car travel in diesel trains is also rendered acutely uncomfortable, as trains in excess of ten cars simply cannot be heated adequately in severe winter weather from the front end. Dog-tired and miserably cold travellers begin to appreciate now the good old reliable steam locomotive, especially when diesel exhaust fumes, sucked into the air-conditioning system, spread their delicate aroma.

The growing toll of train derailments from diesel locomotives jumping the track is also adding to a feeling of uneasiness on the part of the travelling public. Furthermore, the monotony of automatic locomotive operation of the diesel is now regarded by some as a safety hazard, as it tends to dull the senses of engine crews. Steam locomotives, by contrast, require constant alertness on the part of the crews, and it is possible that this factor may have some bearing on the recent succession of several disastrous rear-end collisions, in which diesel trains were involved.

It is my earnest hope that the foregoing statements will be recognised by North American railroads as a timely warning. An enlightened public is now becoming increasingly alert to the consequences of what seems to me to be an entirely unwarranted change to a new form of motive power, which turns out to be as costly as it is unreliable. The growing resistance on the part of consignors and the public to the repeated demands of our carriers for increased rates and fares, stems partly from the growing public realisation that dieselisation means an unjustified channeling of a large amount of rail revenue into wrong directions.

Yours very truly,

PETER NOVAK

132, Dupont Street, Brooklyn 22, N.Y.

## Pay Rates in Nationalised Industries

January 8

SIR,—The recent increase in the wages and salaries of the staff of the Railway Executive, followed by the increase in railway rates and fares and the subsequent announcements by the Coal Board, the Electricity Board and the Gas Board of actual or proposed increases in charges, prompts the thought that the time has come when the final accounts of all the nationalised industries should be linked or amalgamated so that the profit made by one industry at the expense of another could be used to offset the loss incurred.

I think it will be generally agreed that had the Railway Executive been in a position to meet the claims for increased wages and salaries from current surpluses the issue would not have been so unduly prolonged. If this is agreed, it follows that to some extent the Railway Executive was subsidising (at least during the time the negotiations were taking place) the other nationalised industries by carrying their goods, coal particularly, at too low rates.

Lord Hurcomb has referred to the difficulties caused by the time lag between the need for an increase in charges arising and such an increase being authorised and put into effect. Other nationalised industries do not appear to suffer from this handicap.

Surely it is basically unsound to allow the position to arise whereby an attempt to bring the rates of pay in one nationalised industry into line with those obtaining in others must cause an increase in the charges made by all the industries? Is this not encouraging the inflationary spiral?

Yours faithfully,

E. J. MURPHY

221, Devonshire Road, London, S.E.23

## Publications Received

*Untergrundbahnen und ihre Einsatzgrenzen* (*Underground Railways and Their Range of Application*). By Rudolf Berger. Berlin: Wilhelm Ernst & Sohn. 9½ in. × 6½ in. 100 pp. 39 illustrations, 35 tables, 21 maps. Price DM 9·50.—The author has set out to investigate the technical and economic conditions which have lead to the construction of underground railways in different cities. He attempts to draw general conclusions from statistics applicable to the actual events, for example, the population, area and rides-per-head figures when the first underground line in a city was opened. It may be argued that the number of examples available is far too small, and the statistics relating to population and area are too dependent on arbitrary boundaries to afford a reliable basis for a mathematical generalisation of the trends. If the "scientific" approach has thus been rather exaggerated, this is not to say that the subject does not lend itself to some scientific treatment. The planning of underground railways may be regarded, in fact, as a matter of trained intuition, where "trained" is the operative word. For the purpose of such training, this German publication may be regarded as a valuable source of information and, indeed, inspiration, though the treatment can be accepted only with much reserve.

*The Design and Placing of High Quality Concrete.* By D. A. Stewart. London: E. & F. N. Spon, Ltd., 22, Henrietta Street, W.C.2. 9 in. × 5¾ in. 112 pp. Illustrated. Price 25s. net.—Modern demand for higher-class concrete of great strength, especially when pre-stressed, makes more precise specification as well as most careful mixing, placing, and vibration essential. This book is a carefully-reasoned demonstration—supported by up-to-date theory and practical experience—of the manner in which the greatest strength in the material can be obtained without sacrificing economy. After reviewing the past history of concrete, the author defines its characteristics and properties before discussing details of workability. Two chapters are devoted to vibration and the technique of it's application, and others deal with analysis, testing, and specification. Theory and practice are considered side by side and sight is not lost of the contractor's point of view.

*Philips Special Lamp Catalogue.*—Philips Electrical Limited is now distributing a new 16-page special lamp catalogue, in which the full range of Philips projector, floodlighting, and photographic lamps is given, with technical details and so on. Time and light specifications for Photoflux flashbulbs for colour and black-and-white photography are included as well as a complete projector guide.

*Comfortable Travel in Europe.* Published by the Compagnie Internationale des Wagons-Lits and obtainable from principal travel agencies.—This small brochure describes the sleeping and restaurant car and other travel facilities provided by the International Sleeping Car Company. There are illustrations in colour and half-tone of sleeping car interiors, and so on, and a diagrammatic map of the principal routes over which the company's cars work in Europe, North Africa, and the Near East.

# THE SCRAP HEAP

### "Spirit of Progress" Visitors' Book

The parlour car of the well-known "Spirit of Progress" train of the Victorian Railways now contains a handsome, morocco-bound, visitors' book, produced by the Railways Printing Division. Sir Harold Clapp, whose vision made possible the construction of the train, was asked to head the list of signatures. He added the remark: "I am proud to have been associated with the building of this train."

### Snowy Stops the Trains

Snowy, a Thames male swan, delayed rush-hour rail traffic between Putney and Wimbledon for 20 min. by crashing between the lines on Putney railway bridge. He probably tried to fly over the bridge, but hit either the side girders or a passing train, losing his tail. Railway workers could not shift the swan, but he was eventually secured by three policemen.—*From "The Daily Telegraph."*

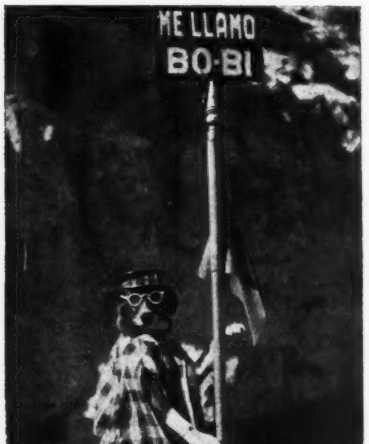
### Dog Crossing Keepers

A correspondent sends us the accompanying illustration of Bo-bi, who works alternate day shifts with his mate Ku-ki as level crossing keeper on the rack-and-pinion railway to Montserrat, near Barcelona.

The crossing, he writes, is closed by means of two chains. One of the two crossing keepers, in uniform cap, holds up a red flag to give warning of the train, when it can be heard puffing in the distance.

Their master sits in a cleft in the cutting, and as soon as a train is due he calls one or other of the dogs and puts on its coat and cap; the dog then runs to the box, leaps on it, and raises the red flag. Once the train is past he runs back to be undressed.

The two dogs come of a family of crossing keepers, and their parents have held down the same job for two generations. They take great pride in their work.




*Bo-bi on duty on approach of a train at a level crossing on the Monistrol—Montserrat Railway*

*"We must be prepared to face every eventuality, gentlemen—nationalisation, denationalisation, renationalisation and re-denationalisation"*

*[Reproduced by permission of the proprietors of "Punch"*

### Garsdale—Social Centre

Garsdale Station, 1,100 ft. above sea level, on the Settle-Carlisle main line, is probably the only station with a lending library on its premises. At one time the Vicar of Sedbergh held services in the waiting room, and the remains of the ancient harmonium used are still at the station.

The brick-walled base of the station water tower has been made into a social hall, which is known as "the ballroom" and draws an attendance of 40 railwaymen and farmers to dances and whist drives. Music is provided by the station-master on his accordion.—*From the January issue of the "British Railways Magazine."*

### London Buses for United States

Three London Transport double-deck buses will be shipped to the United States in March for an 8,000-mile tour organised by the British Travel & Holidays Association. The buses will leave Liverpool on the Cunard steamship *Parthia* and they will be off-loaded in New York.

They will leave on a coast-to-coast tour, and then back again to New York, taking approximately 100 days for the trip. They will return to this country early in July. The buses will be of the same familiar red double-deck type in which thousands of Londoners travel daily.

The crews have already been selected and are at present undergoing special training for the trip. One of the buses is being fitted out as a mobile exhibition and information bureau, the second will be a normal passenger vehicle, used to give rides to residents in the towns where the convoy halts, and the third will act as a combined crew bus and mobile workshop.

### Winding Engine Retires

Another engine has joined the company of famous railway relics in the York Railway Museum. It is the stationary winding engine which, since 1833, has hauled trucks of coal up a 1 in 17 gradient at Swannington in Leicestershire. Built for the Leicester & Swannington Railway by Robert Stephenson, this locomotive was equipped with one of the earliest examples of the piston slide valve, which in improved form is extensively used today.

This is a single cylinder engine 18¼ in. dia. × 3 ft. 6 in. stroke with a working pressure of 80 lb. per sq. in. The "gab" gear, used by hand, enabled the engine to be started in either direction of rotation irrespective of the position of the crank.

### Taking Stock

I long and I labour to find
Some relief from this load on my mind;
I pine for sweet slumber o' nights
And other remorse—free delights.

I confess that, when I was a lad,
I acted one day like a cad
By dumping a whacking great sack
Without thought on the "Light Luggage" rack.
I remember the bump and the bellow
When it fell and half-brained a poor fellow.

I acknowledge the stark, sombre truth
Of another misdeed of my youth;
I ignored what it said o'er the door
And wilfully *penchéd dehors.*

Once I entered a carriage in motion,
Impelled by some sense of devotion,
For the truth of it was—'pon my Sam—
T'was a bad case of *cherchez la femme*;
(Shortly after, I'm sorry to say,
I left hurriedly in the same way!)

I've played cards in trains—nothing shady—
"Nap" or "Solo," but NOT "Find the Lady,"
I abominate pontoon and poker,
Though I once lit up in a "non-smoker."
I realise, too, t'wasn't cricket
To stick to the same platform ticket.

Yes, I mourn for those years of neglect
And sigh for my lost self-respect;
Half a quid should relieve me of strain,
For, so far, I've not pulled down the chain!

A. B.

# OVERSEAS RAILWAY AFFAIRS

*(From our correspondents)*

## VICTORIA

### Conversion to Oil Burning

The first of the Class "N" locomotives, built by the North British Locomotive Co. Ltd., has been converted at the North Melbourne Locomotive Depot to oil burning. The third class "S" locomotive now burns oil and is on the normal "Spirit of Progress" schedule. The four Class "S" locomotives have completed more than 5,000,000 miles since being placed in service in 1928-30.

## INDIA

### Increased Earnings

The gross earnings of the railways for the six months ended September, 1951, were Rs. 1,37,65 lakhs, Rs. 948 lakhs above those for September, 1950-March, 1951. Passenger earnings improved by Rs. 486 lakhs to Rs. 54,69 lakhs, and goods earnings by Rs. 322 lakhs to Rs. 71,93 lakhs. Income from first class traffic decreased by Rs. 26 lakhs and from inter-class traffic by Rs. 32 lakhs, but that from third class and second class increased by Rs. 517 lakhs and by Rs. 127 lakhs respectively. The surplus of Rs. 26,10 crores on revenue account, which the Finance Minister had budgeted for, has already been eaten up, as Parliament passed supplementary grants in October. A deficit of Rs. 77,83 crores was budgeted for on capital account. There is also a deficit created by emergencies on revenue account.

## CANADA

### New Gaspe Line Urged

A delegation has called on the Prime Minister to press the construction of a railway from Matana, Quebec, to Gaspe, *via* Ste. Anne des Monts. It was urged that the project be undertaken to encourage the development of natural resources on the Gaspe Peninsula and provide a route that would be of "capital importance" in time of war. The Canadian National Railways, said the Prime Minister, had studied a similar request, made in 1949, and eight different routes for the lines had been proposed.

## ARGENTINA

### Mitre-San Martin Railways Link

Work has begun on a single-line connection between the main lines of the General Mitre and General San Martin Railways, leaving the Mitre Railway at Recoleta (Buenos Aires) and joining the dead end of a siding of the San Martin Railway which has been unused for many years. New crossovers have been provided on both railways and new track to take the heaviest trains is being laid. A new signalbox on the San Martin Railway has been completed, and signal installations are being erected on both railways.

It is understood that when the work is finished, San Martin main-line trains will use the Presidente Peron terminus of the Mitre Railway, but local trains will continue to use Retiro terminus, doubtless because of lack of platform capacity at Presidente Peron, and as the new link is single line only on an ascending gradient.

### Further Credit for Transport Service

In March, 1951, a decree was issued authorising a credit for 500 million pesos to the Ministry of Transport to cover the deficit of the rail, road, river, and air services under its control during 1950 and 1951. A further credit of 500 million pesos has now been authorised so that services shall not suffer interruption.

### Transfer of B.A. Provincial

On December 29 last, the Minister of Public Works of the Buenos Aires Provincial Government and the Minister of Transport of the National Government signed the document for the transfer of the Buenos Aires Provincial Railway to the Ministry of Transport on January 1, 1952. Both governments will endeavour to fix the value of the railway and its installation at the earliest possible date. It may safely be assumed that it will be absorbed by the General Belgrano Railway as they are both of metre gauge. Reference to this transfer was made in our October 19, 1951, issue.

## IRELAND

### Trial Run of Railcars

The first two of the new C.I.E. diesel railcars made a trial run to Waterford and back last week. The train was composed of units Nos. 2600 and 2601, with a 60-ft. bogie coach marshalled between.

Dublin Kingsbridge was left at 8.40 a.m. and Waterford reached about noon. The train left again at 1.10 p.m. and arrived at Inchicore shortly after 4 p.m. On board were officials of the company, representatives of A.E.C. Limited and Gresham & Craven Limited, and members of the Inchicore Works staff.

### Labour Court Application

An application by the Irish Transport & General Workers' Union for the re-grading of men employed by the G.N.R.(I.) at Dundalk Station was heard by the Labour Court, Dublin, on January 7. Of the 215 men concerned, 67 are members of the I.T. & G.W.U., and the application requests that Grade B workers in Dundalk be raised to the Dublin rate in Grade A, and that all employees in the conciliation grades at Dundalk be paid the same rate as other grades in Dublin.

For the union it was claimed that the amount of traffic handled at Dundalk warranted re-classification and, because of the situation of Dundalk and its Customs importance, much extra work was concerned. It was also pointed out that before the introduction of A and B grading, there was a difference of from 1s. to 3s. 6d. between the Dublin and Dundalk rates—under the present system the difference was from 3s. 6d. to 10s. a week which, it was claimed, was contrary to the cost of living principle on which the recent wages award was based.

Mr. J. F. McCormick, Managerial Executive Officer of the G.N.R., said that if the increase was granted it would cost the company an additional £4,000 a year. He referred to the 1922 wages agreement between the trades unions and the railway companies and pointed out that no fundamental change had been made in this system since that date. It was also pointed out the company employed 1,500 men in Dundalk, the majority of whom were employed in workshops. If the application was granted the shopmen would claim the Dublin rate also.

The Court will make its findings known in due course.

### Unions and C.I.E. Advocates

The Trade Unions and C.I.E. will be allowed two advocates each instead of one when pressing claims before the Republic of Ireland Joint Industrial Council. This decision was taken by the Council recently, and will be subject to review at its discretion.

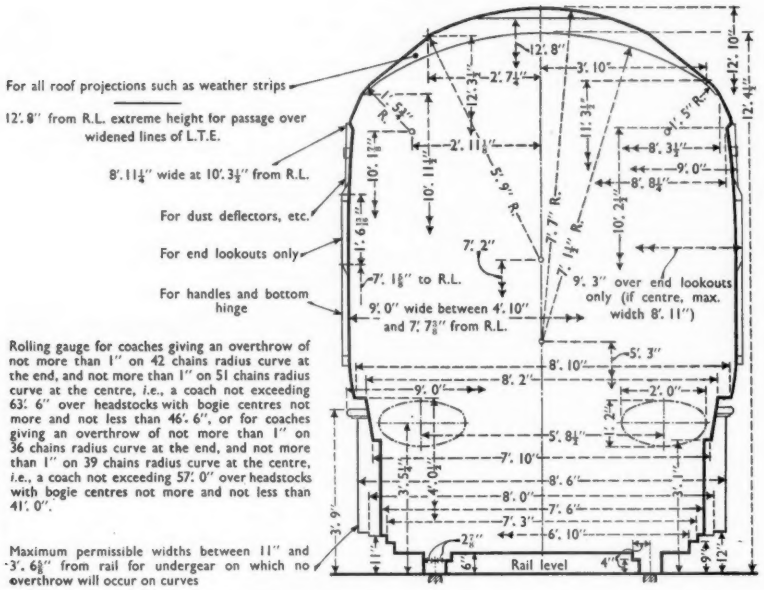
The Joint Industrial Council is composed of representatives of the Unions and the C.I.E., with Mr. Richard McGonigal as Chairman.

## FRANCE

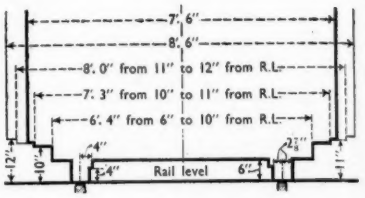
### Creil Locomotive Depot

Continued progress is being made with the reconstruction of the locomotive depot at Creil, almost completely destroyed during the war. The first stage to be completed was the rebuilding of the roundhouse. In August, 1951, the new disposal and preparation tracks were opened. In December a new connection was constructed between the disposal and preparation tracks and the roundhouse; the floor level of the roundhouse was raised by 1 ft. 7 in. to bring it above the flood level of the River Oise. The last stage, which includes the reconstruction of the administrative offices and the staff welfare buildings, is expected to be completed this year.

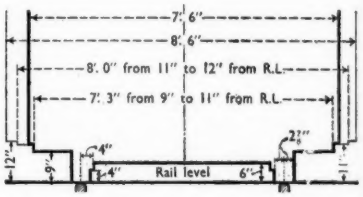
# Typical Rolling Stock Gauges, British Railways


For all roof projections such as weather strips
12'. 8" from R.L. extreme height for passage over widened lines of L.T.E.
8'. 11¼" wide at 10'. 3½" from R.L.
For dust deflectors, etc.
For end lookouts only
For handles and bottom hinge
Rolling gauge for coaches giving an overthrow of not more than 1" on 42 chains radius curve at the end, and not more than 1" on 51 chains radius curve at the centre, i.e., a coach not exceeding 63'. 6" over headstocks with bogie centres not more and not less than 46'. 6", or for coaches giving an overthrow of not more than 1" on 36 chains radius curve at the end, and not more than 1" on 39 chains radius curve at the centre, i.e., a coach not exceeding 57'. 0" over headstocks with bogie centres not more and not less than 41'. 0".
Maximum permissible widths between 11" and 3'. 6⅜" from rail for undergear on which no overthrow will occur on curves
9'. 0" wide between 4'. 10" and 7'. 7⅜" from R.L.
9'. 3" over end lookouts only (if centre, max. width 8'. 11")
Rail level

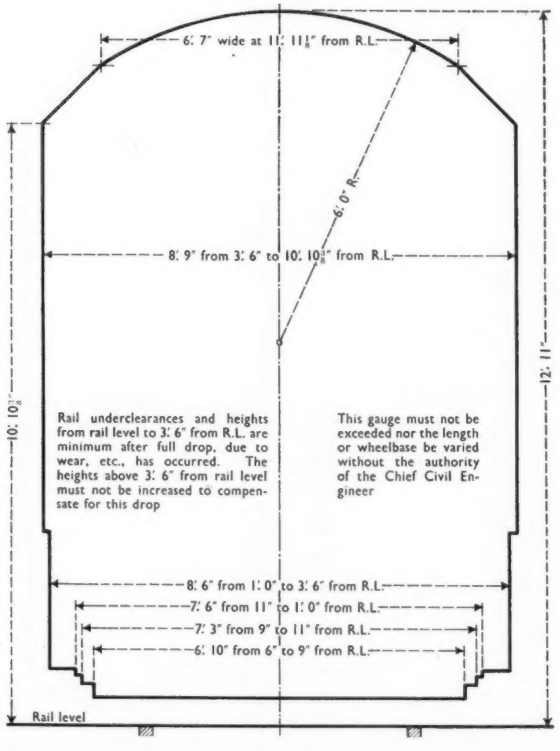
*Passenger rolling stock gauge, giving comparatively free user on the main lines of British Railways*



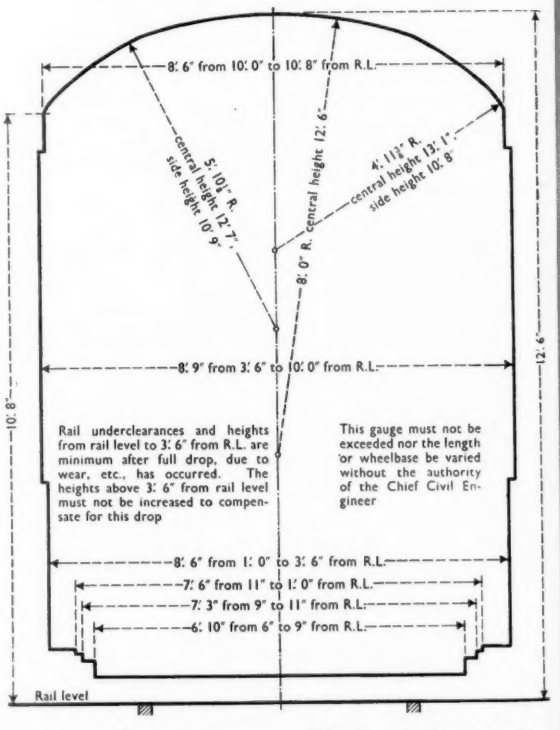

*Rail clearances for electrified portion of the Manchester-Bury line, and the Tottington Branch, L.M.R.*




*Rail clearances for Loftus-Whitby line, N.E.R., British Railways*

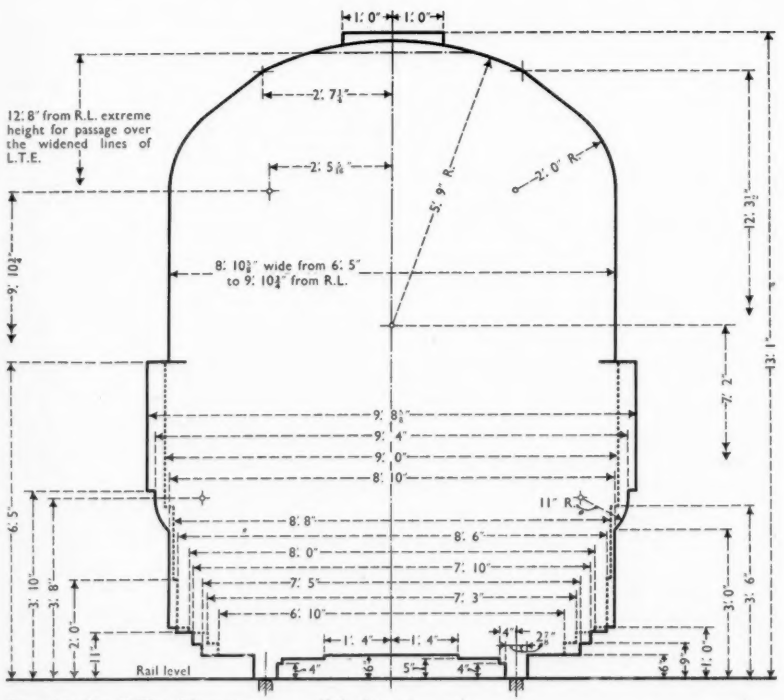

6'. 7" wide at 11'. 11⅛" from R.L.
6'. 0" R.
8'. 9" from 3'. 6" to 10'. 10⅜" from R.L.
Rail underclearances and heights from rail level to 3'. 6" from R.L. are minimum after full drop, due to wear, etc., has occurred. The heights above 3'. 6" from rail level must not be increased to compensate for this drop
This gauge must not be exceeded nor the length or wheelbase be varied without the authority of the Chief Civil Engineer
8'. 6" from 1'. 0" to 3'. 6" from R.L.
7'. 6" from 11" to 1'. 0" from R.L.
7'. 3" from 9" to 11" from R.L.
6'. 10" from 6" to 9" from R.L.
Rail level

*Goods rolling stock gauge W1 for 4-wheel wagons, 17 ft. 6 in. long and with a wheelbase of 10 ft., giving comparatively free user on all lines of British Railways*


8'. 6" from 10'. 0" to 10'. 8" from R.L.
5'. 10½" R.
central height 12'. 7"
side height 10'. 9"
8'. 0" R.
central height 12'. 6"
4'. 11⅛" R.
central height 13'. 1"
side height 10'. 8"
8'. 9" from 3'. 6" to 10'. 0" from R.L.
Rail underclearances and heights from rail level to 3'. 6" from R.L. are minimum after full drop, due to wear, etc., has occurred. The heights above 3'. 6" from rail level must not be increased to compensate for this drop
This gauge must not be exceeded nor the length or wheelbase be varied without the authority of the Chief Civil Engineer
8'. 6" from 1'. 0" to 3'. 6" from R.L.
7'. 6" from 11" to 1'. 0" from R.L.
7'. 3" from 9" to 11" from R.L.
6'. 10" from 6" to 9" from R.L.
Rail level

*Goods rolling stock gauge W2 for 4-wheel wagons, 17 ft. 6 in. long with a wheelbase of 10 ft., giving comparatively free user on all lines of British Railways*

# Typical Locomotive Loading Gauges, British Railways




The outline above 6'. 5" from R.L. represents the maximum outline to which locomotives may be built and any overthrow on this outline must not exceed 5" when locomotives are on a 6 chains radius curve; e.g., if 'throw' on a 6 chains radius curve is in excess of 5" the outline MUST be correspondingly reduced. If 'throw' is less than 5" however, the outline CANNOT be increased

No portion of a locomotive or vehicle situated over the rails with the exception of the wheels shall exceed a width of 2½" measured horizontally on each side of the centre of the rail or be less than 1¼" vertically above the rail when full allowance has been made for wear overthrow on curves, etc.

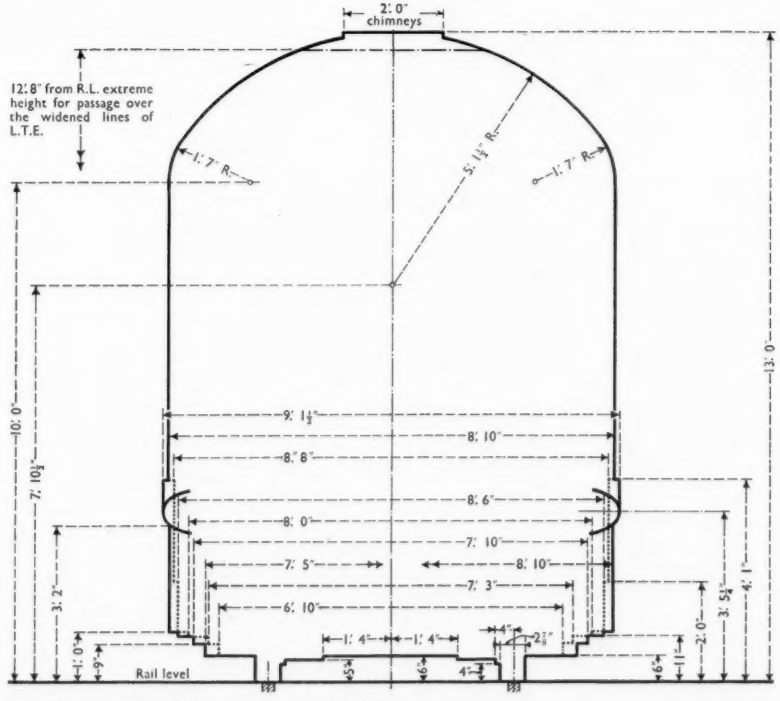
Underclearances and heights from R.L. to 6'. 5" from R.L. are minimum after full drop, due to wear, etc., has occurred. The heights above 6'. 5" from R.L. must not be increased to compensate for this drop

CURVES

Locomotives should be capable of negotiating a curve of 6 chains radius at normal speed and 4½ chains dead slow

Below 6'. 5" from R.L., the dotted outline represents the maximum widths to which locomotives may be built ON CONDITION THAT ANY 'THROW' ON THIS OUTLINE OR ON ANY PART OF THE LOCOMOTIVES OF LESSER WIDTHS THAN THIS OUTLINE MUST NOT EXCEED THE FULL OUTLINE ON A 6 CHAINS RADIUS CURVE; e.g., if 'throw' on a 6 chains radius curve is greater than the difference between the dotted and the full lines, the dotted outline must be correspondingly reduced. If 'throw' is less than the difference between the dotted and the full lines, however, the dotted outline CANNOT be increased.

*Rolling stock gauge L2 for locomotives, giving comparatively free user on the main lines of British Railways*




The outline above 4'. 1" from R.L. represents the maximum outline to which locomotives may be built and any overthrow on this outline must not exceed 4" when locomotives are on a 6 chains radius curve; e.g., if 'throw' on a 6 chains radius curve is in excess of 4" the outline MUST be correspondingly reduced. If 'throw' is less than 4" however, the outline CANNOT be increased

No portion of a locomotive or vehicle situated over the rails with the exception of the wheels shall exceed a width of 2½" measured horizontally on each side of the centre of the rail or be less than 1¼" vertically above the rail when full allowance has been made for wear overthrow on curves, etc.

Underclearances and heights from R.L. to 4'. 1" from R.L. are minimum after full drop, due to wear, etc., has occurred. The heights above 4'. 1" from R.L. must not be increased to compensate for this drop

CURVES

Locomotives should be capable of negotiating a curve of 6 chains radius at normal speed and 4½ chains dead slow

Below 4'. 1" from R.L., the dotted outline represents the maximum widths to which locomotives may be built ON CONDITION THAT ANY THROW ON THIS OUTLINE OR ON ANY PART OF THE LOCOMOTIVES OF LESSER WIDTHS THAN THIS OUTLINE MUST NOT EXCEED THE FULL OUTLINE WHEN ON A 6 CHAINS RADIUS CURVE; e.g., if "throw" on a 6 chains radius curve is greater than the difference between the dotted and the full lines, the dotted outline must be correspondingly reduced. If 'throw' is less than the difference between the dotted and the full lines, however, the dotted outline CANNOT be increased

*Rolling stock gauge L1 for locomotives, giving comparatively free user on all lines of British Railways*

# American Railroad Practice

*Analysis of the report of the O.E.E.C. railway mission to study American organisation and methods*

IN November last the Organisation for European Economic Co-operation published the report of the mission sent to the United States to study railway developments, as recorded in our issue of August 11, 1950. The Association of American Railroads did all in its power to make the visit of the mission both instructive and pleasurable. It is recognised, however, that six weeks was too short a time for a thorough enquiry into American transport and that consequently most of the conclusions in the mission's report, summarised in our December 21, 1951, issue, were bound to be of a tentative nature. We are not surprised to find that the report does not add anything of importance to our knowledge of the U.S.A. railways and are afraid that the accuracy of more than one passage is open to question.

The mission considered that in the U.S.A. land transport, notably railways, played a greater part in economic life than in Europe, where sea shipping was a principal means of communication. The report refers to the Great Lakes, but ignores sea competition between the Gulf of Mexico and Atlantic coast ports, as well as between the East and West coasts *via* the Panama Canal. Neither does it mention the lavish subsidies provided by the Government for the development of inland waterways, to the detriment of the railways.

The mission is on sounder ground when it mentions " the general simplicity reached in the organisation of executive duties," which is effective because full responsibility is given even to minor employees and only on rare occasions is it necessary to refer to higher authority for decision. The result is that " the number of employees needed for a given mileage of track and volume of traffic is relatively small " and a keen competitive spirit is created.

### Freedom for Railway Managements

Then follows a debatable proposition that " in principle the railroads enjoy liberty in their operational matters and their methods of financing, whilst they and their shareholders are answerable for, and have to bear the consequences." Whatever the position may be on the Continent of Europe, the former British railway companies were largely their own masters, whereas the constant complaint of the U.S.A. railways is that they are over-regulated. On the other hand, the mission states correctly that railway financial results " are seldom made public elsewhere in such detail as in the case of the United States." The Association of American Railroads circulates promptly a monthly statement of the revenues and expenses of each Class I railway, with totals for the whole railway system and the regions into which it is divided. The mission might have made the same remark about operating results, because a second A.A.R. monthly bulletin deals with the general transport situation, as explained in the article headed " Forty Weeks of Railroading " in our issue of January 4.

### Return on Investment

The mission was impressed by the A.A.R. activities in studying the problems of co-operation and competition between the various types of transport and in educating the public in the need for an equitable national policy, regulating transport of every kind. The report says that " if up to the present no definite action has been taken, one major explanation is that the American railroads still return a fair dividend (of the order of 4 to 5 per cent.) to their shareholders. The American railroads believe that they are justly entitled to earn an average rate of 6 per cent."

These sentences confuse the rate of cash dividends paid to stockholders with the rate of return on net property investment. The average rate of dividend on stock was 1·7 per cent. in the five years before the war, 2·8 per cent. in the five war years and 3·3 per cent. in the five years from 1946 to 1950. In June, 1951, Dr. J. H. Parmelee, Vice-President, A.A.R., and Director, Bureau of Railway Economics, drew the conclusion from these dividend payments that " except for a few outstanding railroads, the railroad stockholder remains the forgotten man in the security market."

During the same period of 15 years from 1936 to 1950, the rate of return on net property investment averaged 3·7 per cent.; in 1950 the rate of return was 4·2 per cent., compared with 2·9 per cent. in 1949. These percentages represent the ratio of net railway operating income (earnings before charges) to the investment in railway property and it is that ratio which the U.S.A. railways have claimed should be 6 per cent., to enable them to provide the services required in the public interest. Dividends come out of net income, or earnings after interest and other fixed and contingent charges, but so do the costs of improvements, sinking fund charges and debt reductions. The outcome is that railway earnings are not sufficient to attract a flow of fresh capital into the business.

### Extension of I.U.R. Functions

After comparing the work performed by the A.A.R. with the activities of the I.U.R., the mission suggests that the functions of the I.U.R. might be extended " to achieve a still greater degree of co-operation and standardisation," so as to improve the efficiency of the European railway system as a whole. It does not formulate definite proposals for action and its comments on the co-ordination of European transport and tariff policies are also rather vague. On one point the report is emphatic; many European problems, it says, would be easier to handle, and common solutions could be reached sooner, if the same statistics on the financial implications of railway operation existed as in the United States. The statistical members of the mission admired the way in which accounting, statistics and cost-finding are intertwined in U.S.A. to provide means for supervising rational and profitable working. The adoption of a similar system might reduce the annual financial losses on European railways, which run to hundreds of millions of dollars.

Obviously the visit to U.S.A. would be an education to the members of the mission. The reward of the O.E.E.C. enterprise in organising the tour will depend largely on the energy with which questions raised in the report are followed up by the transport authorities and Government departments concerned. In matters of this kind rapid progress should not be expected.

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EXPORT LICENCES FOR ZINC AND COPPER.—Because of the world shortage in the supply of raw materials, together with the high rate of demand for essential purposes, exports of semi-manufactured copper and copper alloys in the second, third, and fourth quarters of 1951 were restricted to approximately half the rate prevailing in the first six months of 1950. The Board of Trade now announces that in conformity with the recommendations of the International Materials Conference exports of semi-manufactured copper and zinc and their alloys in the first quarter of 1952 and until further notice will be licensed at 80 per cent. of the rate of export in 1950.

TRAIN STRANDED IN SNOWDRIFT IN U.S.A.—Two trains equipped with snowploughs, one from Reno, Nevada, and the other from Sacramento, California, forced their way through deep drifts since early on January 14 towards the diesel-hauled " City of San Francisco," of the Southern Pacific Railroad, which became snowbound at noon on January 13 on the west side of the Donner summit in the High Sierra. There were 226 persons in the stranded train, without light or heat because of the exhaustion of its fuel. Four passengers who left the train in a snow tractor reported that carbon monoxide gas had badly affected many of the passengers, of whom 27 were " stretcher cases." The rescue train from Reno reached Norden and unloaded a dog team and sledge. A physician and his assistant, with a sledge loaded with medical supplies, started from there to make their way to the stranded train 15 miles away. The other rescue train, which had been able to make only 5 m.p.h. through the drifts, was reported to be still 7½ miles from its objectives. From there the snow tractors it carried would have another 4½ miles to go. A helicopter able to carry six stretcher cases left Sacramento to fly to the stranded train.

# Efficiency of Steam and Electric Locomotives

## *Factors affecting consumption of fuel: comparison in comparative power output*

*By J. L. Koffman*

CURRENT concern with locomotive efficiencies is largely caused by the facts that there are four types of propulsion system to choose from, and that fuel prices are still rising. Regarding fuel efficiency, *i.e.*, fuel consumption in terms of trailing ton-miles, some out-of-date and misleading data have sometimes been given prominence. The term "efficiency" has not always been clearly defined; and the impression has been given that locomotive boilers are 65 per cent., whilst those of power stations are only 75 per cent. efficient. The actual efficiencies of locomotive and power-house boilers are more correctly 75 and 90 per cent., respectively. This efficiency refers only to the boiler as heat-extracting and heat-transfer equipment. The actual cycle efficiency is quite another matter, depending on various mechanical and thermal design factors.

By confusing these different efficiencies a distorted picture is frequently given which does not do justice to the present state of development of boilers and turbines. Similarly, the totting up of efficiencies usually at one operating point only does not show clearly the advantages or otherwise of locomotives, as it does not always embrace the effect of weight, tractive resistance, or ability to run through curves without appreciably reducing speeds. In addition, the efficiencies at part loads are often passed over, though traction engines are above all variable-load machines demanding constant or at least gently curved efficiency characteristics (as opposed to the too familiar parabola).

The thermal efficiency $\eta_b$ of locomotive boilers depends upon the rate of evaporation and amount of fuel burnt, the general dependence being indicated in Fig. 1 (due to Professor Lamonosoff.) Here $\eta_b$ is plotted as a function of fuel consumption W[lb./hr.] over grate area A [sq. ft.] for a constant value of the load factor L [B.Th.U./(sq. ft.) (hr.) ($10^6$)]. If no steam is delivered then obviously $\eta_b = o$, but within the limits of L = 0·3 to 2 it is possible to estimate $\eta_b$ as a direct function of L, *i.e.*, $\eta_b = a - b \times L$ as already shown by Strahl.[1] Chapelon[2] suggests equations based on tests carried out on a 4-8-0 locomotive of the former P.L.M. Railway with a rather long, narrow firebox, *i.e.* :

$100\eta_b = 85 - 0{\cdot}265$ W/A as mean value

$100\eta_b = 93{\cdot}8 - 0{\cdot}17$ W/A as maximum value

as compared with Strahl's

$\eta_b = 0{\cdot}85 - 0{\cdot}176$ W

whilst tests with Russian oil-fired locomotives suggest[3]

$\eta_b = 0{\cdot}85 - 0{\cdot}122$ L

for L of 0·75 to 1·5.

The values of boiler efficiencies obtained according to some of the above equations are plotted in Fig. 2, together with experimental results obtained in this country[4] and U.S.A.[5] Further data have been published.[6] For the purpose of the present comparison, $\eta_b$ is assumed to 75 per cent.

The ideal cycle efficiency of an up-to-date compound locomotive with a boiler pressure of 285 lb./sq. in. gauge, 750° F. superheating temperature and feed water pre-heated to 212° F. will amount to $\eta_b = 0{\cdot}221$.

The indicated thermal efficiency can be assumed to $\eta_i = 0{\cdot}75$ whilst the losses due to auxiliary equipment, etc., are assumed to 5 per cent., *i.e.*, $\eta_a = 0{\cdot}95$.

### Locomotive Engine Performance

The plot of theoretically determined losses over locomotive speed shows that whilst some decrease, others are on the increase, the sum total being such that

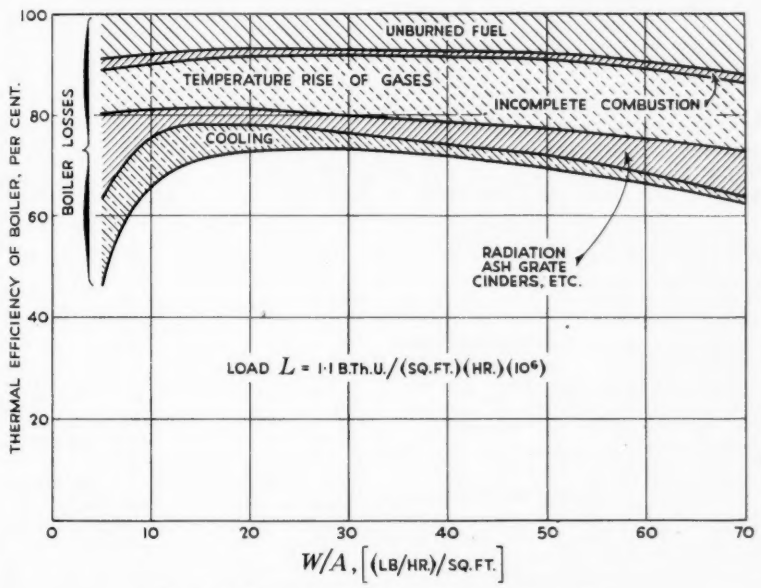


*Fig. 1—Thermal efficiency of locomotive boiler*

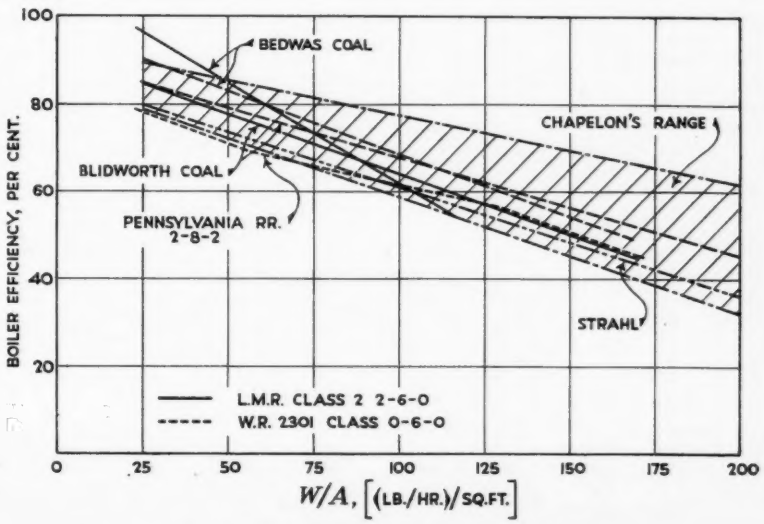


*Fig. 2—Boiler efficiency as function of load*

there is a minumum at a certain road speed at which the steam consumption per indicated H.P. will also become a minimum, Fig. 3. In other words, the indicated power output is a function of the boiler load factor L and the speed V. According to Achterberg[7] and subsequently Meineke[8] the minimum specific steam consumption can be determined in accordance with the equation in Fig. 4. This is based on evaluation of locomotive test data obtained at Grunewald and is

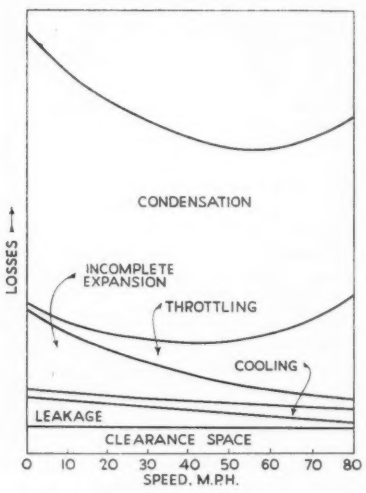


*Fig. 3—Locomotive engine losses*

applicable within a superheated steam range having an entropy of 1·68 to 1·72 and can serve as a criterium for average good designs.

The mechanical efficiency of the driving gear interposed between the pistons and wheels usually amounts to 90 to 95 per cent. Here we assume $\eta_m = 0{\cdot}95$.

### Locomotive Efficiency

This can be determined on the basis of the above data as: $\eta_l = \eta_b \times \eta_{th} \times \eta_i \times \eta_a \times \eta_m = 0{\cdot}75 \times 0{\cdot}22 \times 0{\cdot}75 \times 0{\cdot}95 \times 0{\cdot}95 = 11{\cdot}2$ per cent. This value is as high as can be expected from a somewhat complicated design which is foreign to the practice adopted by the Railway Executive whose new standard range is not to "leave its vantage ground and once more descend to the complexities of the compound, the turbine and the condenser." The efficiency of typical French National Railways engines is plotted against time in Fig. 5. Without introducing very appreciable complications, the value of about 11 per cent. is all that can be expected of a steam locomotive built on conventional lines. The highest value of $\eta_l$ obtained for an ordinary locomotive was 11·4 per cent,[8] whilst in Britain values of up to 10·8 per cent. were achieved.[9] On Russian railways with coal firing the value of 9 per cent. was not exceeded, but of recent times 10·5 per cent. is aimed at.[10] In this case, feedwater is preheated to 210° F. and combustion air to 400° F. whilst the temperature of (superheated) steam is up to 930° F. If one is prepared to depart from the classic Stephenson locomotive and its boiler then improvements in overall efficiencies should be possible on the following lines: The use of oil firing can increase $\eta_b$ by some 7 to 8 per cent., provided the boiler design is altered to suit.

The use of boilers of the Velox or La Mont type can permit the achievement of the value $\eta_b = 0{\cdot}85$. The value of $\eta_{th}$ can be increased by reducing the exhaust losses with the help of a rotary exhauster as used with Velox or La Mont boilers, by the use of condensers and by increasing the pressure and superheat temperature. An analysis of $\eta_{th}$ indicates that 0·38 can be attained at a pressure of 850 lb./sq. in. a steam temperature of 930° F., which is as high as can be tolerated by cylinder lubrication, and a condenser ensuring a vacuum of about 11·5 lb./sq. in. By the use of individual axle drive reciprocating engines with a large degree of expansion it should be possible to attain $\eta_i = 0{\cdot}8$ provided the expansion is carried out by a turbine

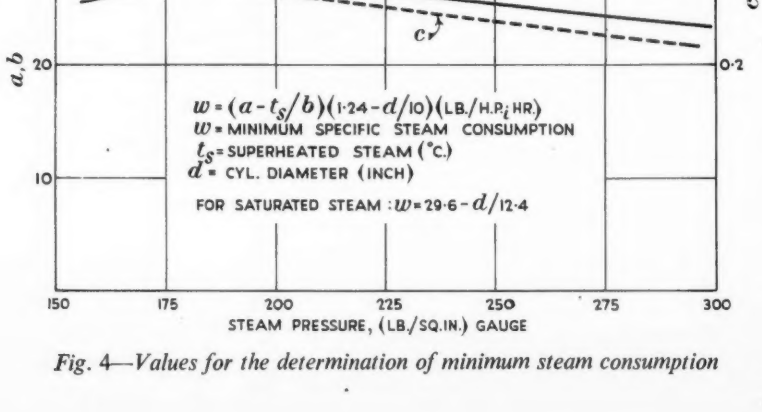


*Fig. 4—Values for the determination of minimum steam consumption*

With condensers this value will be reduced to $\eta_i = 0{\cdot}77$ whilst the power required by the condenser cooling fans will also reduce $\eta_a$ to 0·88. On the other hand the use of individual axle engines will increase $\eta_m$ to about 0·97. Thus a locomotive incorporating the various departures mentioned above may have an overall efficiency of $\eta_l = 0{\cdot}22$.

That it is possible to approach these theoretically attractive solutions and appreciably increase $\eta_l$ was shown by the three experimental engines tested[11] by the French National Railways. Here, the conventional value of $\eta_l$ was increased

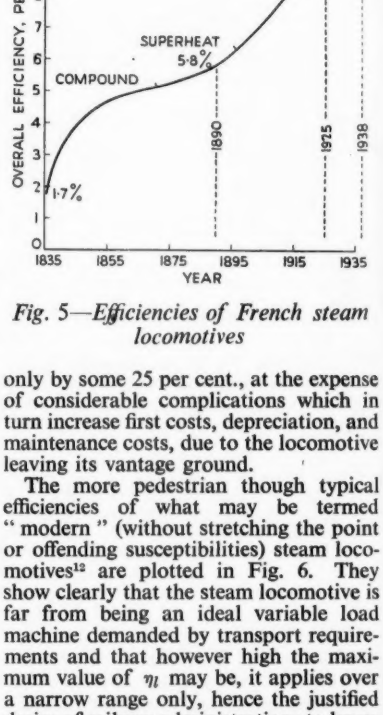


*Fig. 5—Efficiencies of French steam locomotives*

only by some 25 per cent., at the expense of considerable complications which in turn increase first costs, depreciation, and maintenance costs, due to the locomotive leaving its vantage ground.

The more pedestrian though typical efficiencies of what may be termed "modern" (without stretching the point or offending susceptibilities) steam locomotives[12] are plotted in Fig. 6. They show clearly that the steam locomotive is far from being an ideal variable load machine demanded by transport requirements and that however high the maximum value of $\eta_l$ may be, it applies over a narrow range only, hence the justified desire of railway administrations to know more about the fuel consuming habits of their engines and the—of recent times more pronounced—desire to put the right engine to the right job. Generally, the efficiency is about 8-10 per cent. at the best performance point, falling rapidly at other load/speed conditions.

### Electric Traction

In the case of electric traction the overall thermal efficiency of modern power stations is of a very much higher order than that of steam locomotives and certainly of a higher order than the values quoted in the May, 1951, issue of *Diesel Railway Traction.*

To start with, the boilers have an efficiency of 85·5 to 90·3 per cent. with an average of 89 per cent., whilst the turbines have an indicated efficiency of about 88 per cent. The generators have an efficiency of about 96 per cent. In the

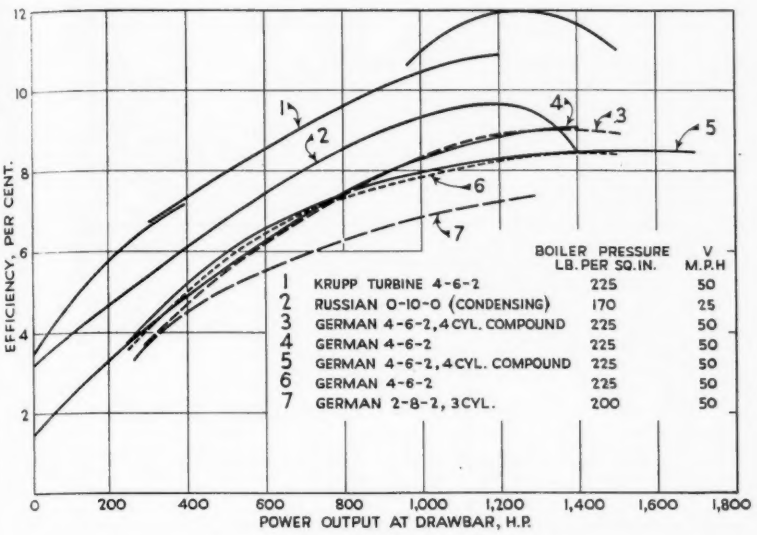
EFFICIENCY, PER CENT.
POWER OUTPUT AT DRAWBAR, H.P.
BOILER PRESSURE LB. PER SQ.IN.
V M.P.H
1 KRUPP TURBINE 4-6-2 225 50
2 RUSSIAN 0-10-0 (CONDENSING) 170 25
3 GERMAN 4-6-2, 4 CYL. COMPOUND 225 50
4 GERMAN 4-6-2 225 50
5 GERMAN 4-6-2, 4 CYL. COMPOUND 225 50
6 GERMAN 4-6-2 225 50
7 GERMAN 2-8-2, 3 CYL. 200 50

*Fig. 6—Steam locomotive efficiency*

case of gas turbine plants the compressor and turbine polytropic efficiencies can be 89 and 87 per cent., respectively.[13] The mechanical efficiencies of turbines and compressors can be assumed to 98·5 per cent. In the case of steam plants the use of steam pressures of up to 2250 lb./sq. in. and temperatures of up to 1050° F. with after heating to 1000° F., together with

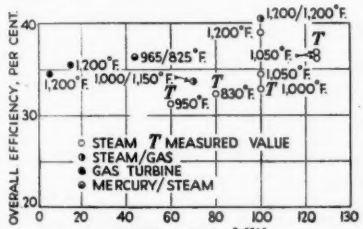


*Fig. 7—Efficiencies of modern power stations*

multi-stage regenerative water pre-heating up to 465° F., very low exhaust gas temperature (down to 230° F., boiler efficiency of up to 92 per cent.), gas-tight jacketing of the boiler, the use of air at slight pressure for combustion (instead of exhausters), together with more efficient low pressure turbines has resulted in very high overall efficiencies. A perusal of the data presented at the World Power Conference in 1950 shows that efficiencies of the order of 32 to 36 per cent. have been achieved and higher values will be attained in the near future when steam temperatures of 650° C. will be attained (Fig. 7). At present, it will be justified to assume an overall station efficiency of $\eta_s = 0{\cdot}32$. Assuming that 7 per cent. of the output are used within the station: $\eta_s = 0{\cdot}3$.

The efficiency of the transmission to the substation can be assumed to $\eta_t = 0{\cdot}9$ whilst the efficiency of the substation including the losses up to the locomotive

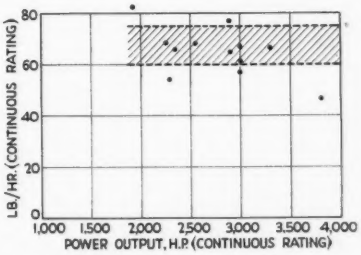


*Fig. 8—Specific weight of modern electric bogie locomotives*

current collector and the rail return is taken to $\eta_o = 0{\cdot}84$. Finally, the electro-mechanical losses of the locomotive are taken as $\eta_l = 0{\cdot}9$. Thus the overall fuel to wheel efficiency of electric traction (d.c.) amounts to:

$$\eta_{el} = 0{\cdot}3 \times 0{\cdot}9 \times 0{\cdot}84 \times 0{\cdot}9 \cong 20 \text{ per cent.}$$

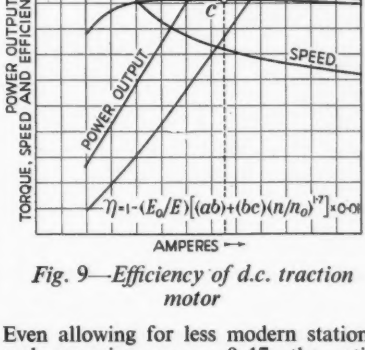


*Fig. 9—Efficiency of d.c. traction motor*

Even allowing for less modern stations and assuming $\eta_{el} = 0{\cdot}17$ the ratio $\eta_{el} / \eta_l$ is still 1·5. Compared with the load-efficiency curve of the steam locomotive that of an electric motor is almost constant over a very wide range[14] (Fig. 9). In the efficiency equation *a-b* (in per cent.) represent the $I^2R$ or ohmic losses and brush contact losses whilst *b-c* embraces the iron or core losses, windage losses and bearing losses. The speeds $n$ and $n_o$ are those attained at the given current and actual voltage E and the voltage $E_o$, respectively. This combined with the ability of grouping the motors in case of d.c. traction or tapping the transformer with a.c. ensures good efficiencies over very wide operating ranges.

### Fuel Consumption

With modern locomotives, the specific fuel consumption at 12 per cent. of the maximum output is only 1·18 that of the consumption at full output, the speeds concerned being 41 and 100 per cent., respectively. If a modern mixed-traffic Pacific locomotive developing a maximum of about 2000 h.p. is compared with a Bo-Bo electric locomotive of identical output, it will be found that the former, together with tender and two-thirds of its water and coal supply weighs 130·5 tons (British Railways Class 7), out of which some 61 tons are carried on the drivers.

Locomotives of the double-bogie type weigh (Fig. 8) 60-75 lb./h.p. (continuous output)[15] as compared with 220, 200 and 175 lb./h.p. for 1000, 2000 and 3000-h.p. steam locomotives so that a unit of the type dealt with will weigh about 60 tons.

The difference of 70 tons in weight is equivalent to that of two bogie carriages. The tractive resistance of the steam locomotive is given by the equation:[16]

$$R = aW_{tr} + bW_d + C_d \times 0{\cdot}26 \times A(V/10)^2 + cW_{tot} \text{ [lb.]}$$

where $a = 4{\cdot}5$ [lb./t.], $W_{tr}$ = trailing weight (including tender) [t], $b = 16$ [lb./t.] for six coupled wheels, $W_d$ = adhesive weight [t], $C_d = 0{\cdot}6$ the drag coefficient, A = Equivalent frontal area [sq. ft.], V = speed [m.p.h.], $c$ = function of speed and $W_{tot} = W_{tr} + W_d$ [t].

In the case of the electric locomotive:

$$R = aW + C_d \times 0{\cdot}26 \times A(V/10)^2 \text{ [lb.]}$$

where: $a = 9$ [lb./t] and $C_d = 0{\cdot}4$.

These values apply for locomotives pulling trains. For single engines the value of $C_d$ will be higher. The values of power required to propel the locomotives at the head of trains (Fig. 10) speak for themselves. Even more serious is the loss of tractive effort due to locomotive weight on lines abounding with grades, whilst on lines incorporating many curves the ability of bogie locomotives to pass these at higher speeds results in saving time and energy and brake blocks, *i.e.*, increased overall efficiency. The ratio of the tractive effort at drawbar $T_e$ to the indicated tractive effort $T_i$ as based on the above considerations and estimated for a number of modern engines is plotted in Fig. 11.

### Comparative Values of Systems

French investigations[11] have shown that the comparative values of the two traction systems can be expressed by an equation:

$$P_t/P_d = 1 + W_{tot} \times r/W_{tr} \times r_t$$

where $P_t$ = power output at the wheels/heat content of fuel = overall efficiency, $P_d$ = power output at drawbar/heat

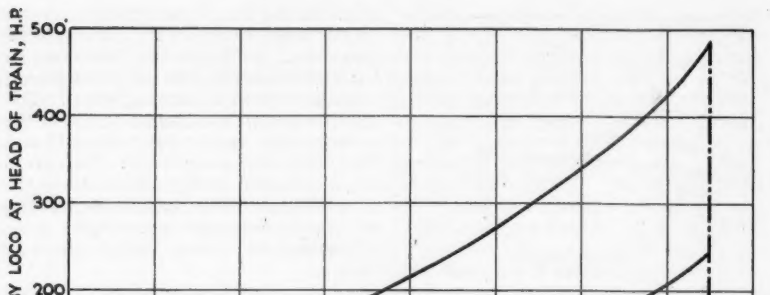


*Fig. 10—Power required to drive locomotive*

content of fuel = drawbar efficiency, $W_{tot}$ = locomotive weight, $W_{tr}$ = train weight $r_t$ = specific tractive resistance of train including air resistance [lb./t.], $r$ = specific tractive resistance of locomotive (not including air resistance) [lb./t.]. With $r/r_t$ being about 1·35 we have: $P_t/P_d = 1 + 1{\cdot}35\ W_{tot}/W_{tr}$. For conditions obtaining in France, the handling of 1,000 trailing ton-miles required 214 lb. of coal (average steam locomotive efficiency of 8·3 per cent.) compared with 49·5 at power house and 46·25 kWhr. at entry to substation. The specific fuel consumption of a modern power station can be as low as 0·8 lb./kWhr.

Even assuming 1·2 lb./kWhr., *i.e.*, a power station efficiency of only 20 per cent., the ratio of drawbar efficiency of electric traction/drawbar efficiency of steam traction will be 3·25 although the ratio of overall efficiencies is only 1·5. Allowing for the use of modern steam locomotives throughout the fuel consumption would be 144 lb./1000 trailing ton-miles compared with 65·5 for electric traction, the ratio of drawbar efficiencies being 2·25. The low mean efficiency of steam traction is well known; German investigations suggest a mean drawbar efficiency of 3 to 4 per cent., and French analysis[17] indicates values of only some 2·5 to 3 per cent.

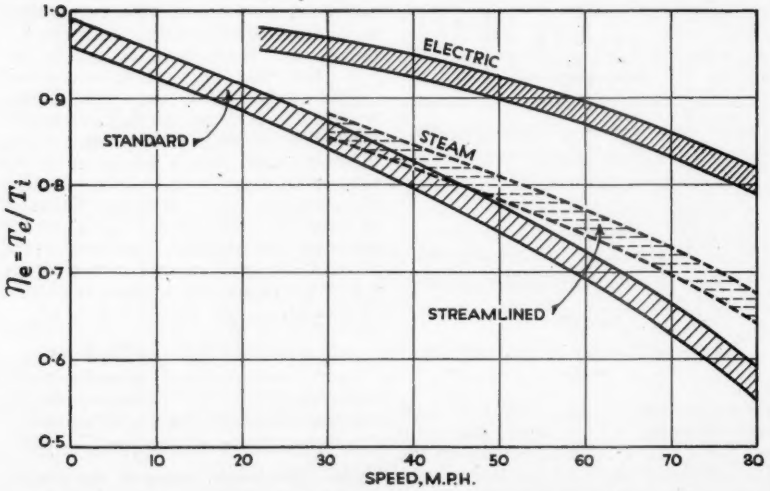


*Fig. 11—Ratio of effective to indicated tractive effort*

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MECHANICAL HANDLING EXHIBITION. — Greater output at lower cost will be the theme of the third Mechanical Handling Exhibition & Convention to be held from June 4 to 14, at Olympia. The exhibits of about 170 firms, to occupy 250,000 sq. ft., will include conveyors, elevators, hoists, stackers, cranes, mechanical loaders and shovels, fork-lift trucks, coal handling plant, wagon tipplers, and so on.

FUEL CONSERVATION PRODUCTIVITY TEAM.— The conservation of fuel will be a timely subject for a productivity report and will be among the series issued by the Anglo-American Council on Productivity in the near future. The specialist team concerned with its preparation is due to sail on January 31 for New York, under the leadership of Mr. W. L. Boon, of Powell Duffryn Technical Services Limited. The Secretary will be Mr. W. J. Dickie, of the Federation of British Industries.

POSSIBLE PURCHASE OF SECTION OF GREENORE RAILWAY.—At the meeting of the Newry Port & Harbour Trust last week a letter was read from the General Manager of the Dundalk Newry & Greenore Railway stating that it had been suggested that the lines should not be lifted as there was a possibility of their use as the rail link between the new wharf and Newry town in connection with the £80,000 Rough Island development plan. He said that it was the intention to obtain authority to abandon and sell the whole undertaking If the Trust were interested in that section of the line between Newry and the land boundary between Northern Ireland and Eire it should set about obtaining the necessary powers. The acquisition price would be much more reasonable now than if the Trust were to let the chance go and later attempt to lay the track itself. The Trust replied that it was considering the acquisition of the stretch of line.

# Special Wagons for Iron-Ore Traffic

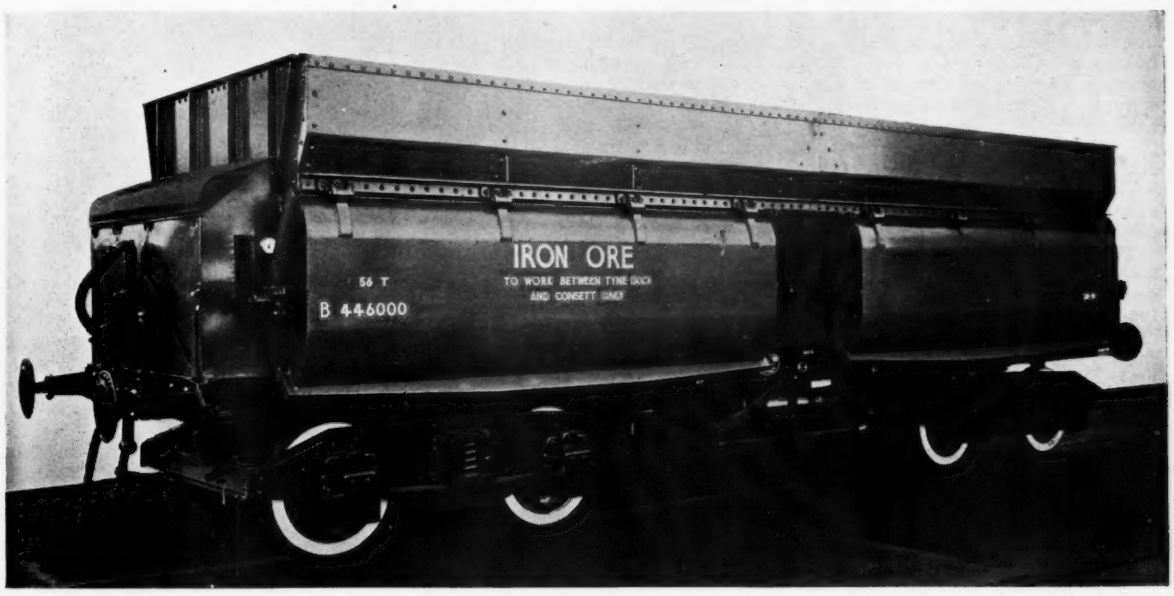
*Equipped with power-operated side-discharge doors worked simultaneously by compressed air controlled from the footplate*

IN our issue of December 21, 1951, brief particulars were given of an entirely new type of wagon designed by British Railways for conveying iron ore from Tyne Dock to the steelworks at Consett. The wagons, thirty of which are under construction at Shildon, are being built of Corten steel, specially chosen as a safeguard against atmospheric corrosion and to enable them to withstand severe abrasive action in service. They are carried on two four-wheel bogies, have a tare weight of 28 tons 13 cwt., and will hold up to 56 tons of ore.

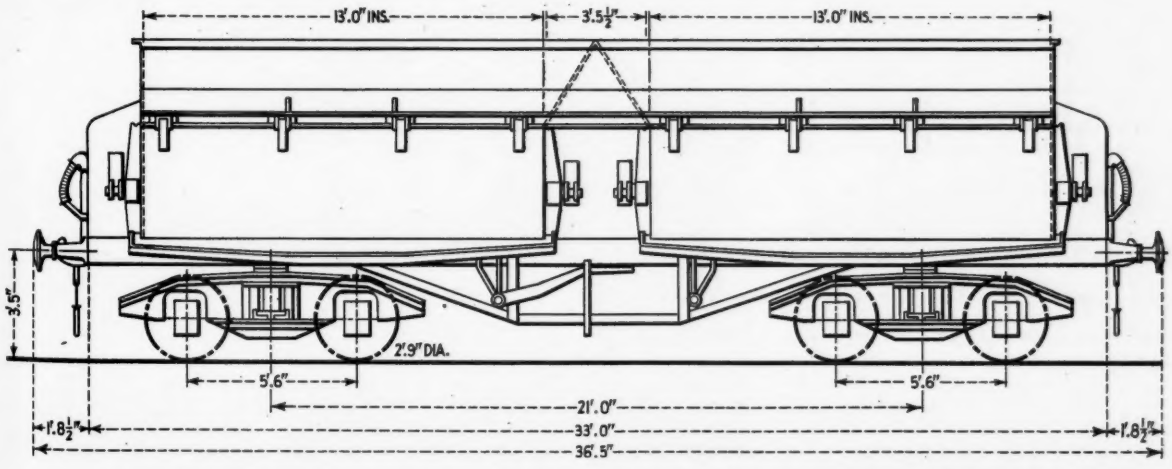
The body is of part-welded and part-riveted construction. Standard rolled sections have been used for the body framework and the hopper supporting frame, and Corten steel for the plating, the plates in the sides, ends, and doors being $\frac{1}{4}$ in. thick and the hopper plates $\frac{5}{16}$ in. thick. The underframe is constructed of standard 10 in. × $3\frac{1}{8}$ in. rolled-section channels welded together, and trussing has been provided under the solebars only. The hopper supporting frame is mounted on and welded to the underframe. Two 18 in. vacuum brake cylinders have been provided and give a brake power of $26\frac{1}{2}$ tons.

Buffing and drawgear follow as near to standard practice as possible. Each buffer has nine rubber buffing springs, and one rubber recoil spring, while the drawgear which takes the pull immediately behind the headstock has four rubber springs. Screw couplings have been fitted and the vacuum brake hose connections are standard.

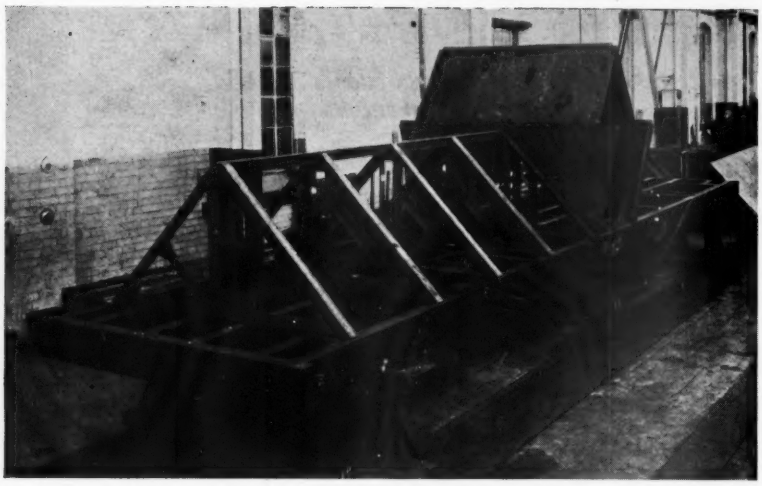
The bogies, each capable of carrying 35 tons on pivot, have had to be specially designed. The bogie framework is made of standard rolled sec-




*One of thirty 56-ton steel wagons fitted with pneumatic doors which are being built by British Railways*




*General arrangement and dimensions of ore wagon fitted with power-operated discharge doors*



*Wagon under construction, with hopper framing mounted on underframe*

tions with sole plates 1 in. thick. The bolster is a standard 10 × $3\frac{5}{8}$ in. channel mounted on four steel helical springs. Renewable manganese-steel rubbing plates have been provided at the bolster horn blocks. Rolled-steel disc wheels 2 ft. 9 in. dia. on tread, which can be re-tyred, are mounted on axles with journals 12 in. long by 6 in. dia.

The axleboxes are bolted to the bogie soleplates, and are of the cast-steel open-fronted type fitted with standard type bearings, Armstrong pattern lubricating pads, and loose oil trays. Dust shields also have been fitted. Clasp brakes have been fitted and all brakework holes have been bushed. The gear has a leverage of 6 to 1.

### Compressed Air Operating

Compressed air was adopted as the operating medium, and as it was apparent that there was no suitable standard equipment in existence, the whole of the operating and control mechanism was designed and manufactured within the Railway Executive resources. The arrangements consist of two cylinders mounted on a fabricated baseplate in the form of an inclined plane.

One cylinder is 14 in. dia., with a stroke of 12 in., and its function is to close the doors. The cylinder for opening the doors has a diameter of 16 in. and a stroke of 12 in. The cylinders are so mounted that they work in opposition to each other and so obviate any tendency to shock-load the gear. Each has a piston with a stainless-steel hollow piston rod which fits on to a spigot on a triangular crosshead. This crosshead operates two intermediate or fulcrum levers which in turn are connected to the rods which push the doors open and pull them shut.

The intermediate levers are mounted on trunnion type bearings, and a short shaft has been provided on which is welded a shoe which engages on suitable faces of the crosshead when the doors are in the closed position. This shoe can only be operated manually and forms a lock to prevent accidental power operation of the doors during transit.

Between the two engines which operate each pair of doors a long shaft has been provided which rests in bearings situated in the hopper support framing and is coupled to the locking shoe shafts. This makes it necessary to raise or lower a lever secured to the locking shoe shaft on the door engines at the ends of the wagon only. By this means the danger of twisting a pair of doors by the accidental non-operation of one mechanical lock has been obviated.

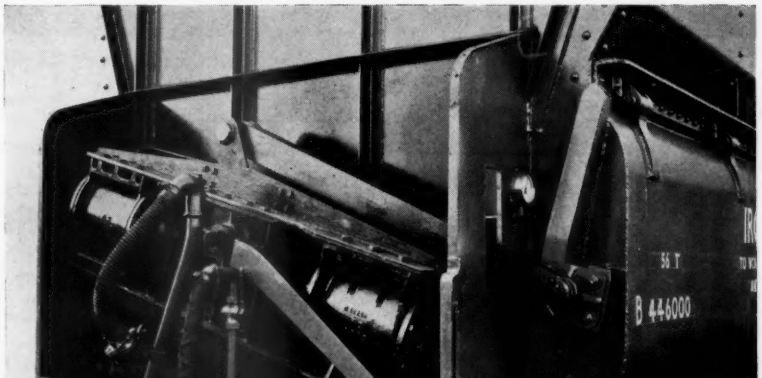
Minimum length of vehicle was one of the stipulations laid down and consequently the amount of room available for accommodating the door engines was limited. Therefore they are not as accessible for lubrication as would have been desirable. To meet this contingency Preservoil bushes have been provided in all the bearings and a Preservoil sleeve is fitted in the cylinder head through which the piston rod works. Four air reservoirs 15 in. dia. × 40 in. long, with the necessary piping and valves, are situated on the underframe. Air at a pressure of 80 lb. per sq. in. is obtained from two compressors on the locomotive.

### Sequence of Operation

In service the sequence of operation is as follows:—

1. Train of eight or nine empty wagons, with all air and vacuum pipes correctly coupled, standing in sidings. All doors secured by manually operated locking device. No pressure of air in reservoirs on wagons. No engine attached to train.
2. Attach engine and couple air and vacuum pipes. Isolating cocks on wagon at opposite end to engine to be in closed position. Proceed to loading point and commence to create necessary air pressure.
3. Load wagons under bunkers.
4. Commence journey. During the journey the compressors on the locomotive should be in operation to charge the air reservoirs on the wagons. When the necessary pressure has been reached the automatic cut-out on the compressor will function. At this stage the pressure in the 14-in. dia. cylinders will have the effect of holding the doors closed in addition to the manually operated lock. (In the event of a compressor failure there would be no objection to the wagons travelling with the doors being held closed by the manual device only.)
5. Arrival at destination. It has been

(*Continued on page 78*)




*Close-up of end door engines*

# RAILWAY NEWS SECTION

## PERSONAL

Mr. Robert Flack, Chief Accountant, General Mitre Railway, Argentina, has retired.

Mr. Fernando A. Cerrajeria, formerly of the National Railway Board, Argentine Ministry of Transport, who, as recorded in our November 30 issue, has taken charge of the General Urquiza Railway, will have the title of General Supervisor in charge of the Management, with the specific objective of undertaking a complete reconstruction of the whole railway and the provision of an efficient suburban electric service in the Buenos Aires section. He was born in Gualeguay, Province of Entre Rios, in 1913, and was educated in Buenos Aires, where he obtained his degree as Civil Engineer. Mr. Cerrajeria began his professional activities in private industry, but subsequently entered public service, joining the National Co-ordination of Transport Board and later becoming General Inspector of the National Transport Board in the Ministry of Public Works. Shortly afterwards he was appointed President of the Highways Board of the Province of Cordoba. He subsequently held the positions of Manager of the Cordoba Electric Tramways Company, and Minister of Public Works of the Cordoba Provincial Government. On his return from the Province of Cordoba, Mr. Cerrajeria joined the Argentine Ministry of Transport, where he served on the National Railway Board.

Mr. J. H. Glendinning, District Engineer, Boston, Eastern Region, has been appointed District Engineer, Peterborough.

Mr. A. E. Moulton has been appointed a Director of George Spencer, Moulton & Co. Ltd.

Mr. S. G. Monk, formerly District Surveyor, Grimsby, Eastern Region, has been appointed District Estate Surveyor, Preston, London Midland Region.

Mr. H. T. Booker, who, as recorded in our January 4 issue, had been deputising as General Manager of the Central Railway of Peru, Peruvian Corporation Limited, and has now been confirmed in that post, joined the Peruvian Corporation

*Mr. Fernando A. Cerrajeria*

Appointed General Supervisor in charge of the Management, General Urquiza Railway, Argentina

*Mr. H. T. Booker*

Appointed General Manager of the Central Railway of Peru, Peruvian Corporation Limited

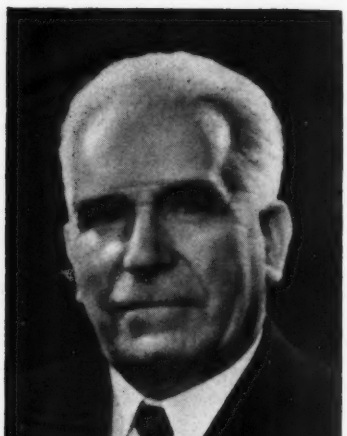
Mr. K. B. Mathur, Chief Operating Superintendent, East Indian Railway, has been appointed General Manager, Bengal Nagpur Railway, in succession to Mr. P. C. Bahl. Mr. Mathur, who became General Manager of the East Indian Railway in the absence of Mr. B. B. Varma, in March, 1951, later resumed as Chief Operating Superintendent on Mr. Varma's return from leave.

Mr. Leslie Gamage, Vice-Chairman & Joint Managing Director of the General Electric Co. Ltd., left London Airport for Johannesburg on January 10, on the first stage of a business tour of South Africa and Rhodesia, lasting some ten weeks.

We regret to record the death on December 22, at the age of 54, of Mr. Hilbert P. Schremp, General Traffic Manager of the Aluminum Company of Canada, and of its subsidiaries, the Roberval & Saguenay Railway and the Alma & Jonquieres Railway.

from the Nitrate Railways in May, 1925, as a District Engineer on the Central Railway. He was appointed Assistant Chief Engineer, Central Railway, in November, 1933, and Chief Engineer in January, 1936. Mr. Booker had been deputising as General Manager for the late Mr. G. W. Morkill since July 6, 1951.

The governing body of the University of Stellenbosch, South Africa, has conferred an honorary D.Sc. degree on Mr. M. C. van Schoor, for his work in connection with the electric train tablet apparatus known by his name. Mr. van Schoor retired in 1940 as Acting Electrical Engineer, South African Railways, but was retained by the administration in a consultative capacity. The apparatus incorporates improvements on the earlier Tyer instruments of this class, and for some time past was adopted officially for new work by the South African Railways, which at the time of its introduction gave a monetary award to the inventor.



*Mr. Jakob Bertschmann*

Superintendent, Traction & Mechanical Workshop Department, Rhaetian Railway, who has retired

*Mr. Alfred Baechtiger*

Appointed Superintendent of Traction & Mechanical Workshop Department, Rhaetian Railway

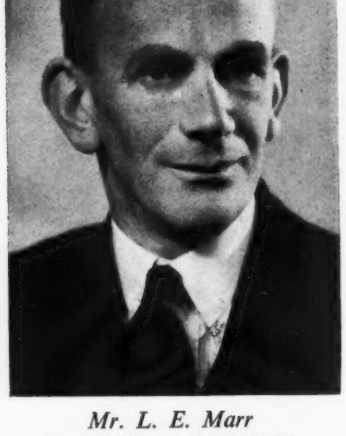
*The late Mr. T. B. Stewart*

Commercial Superintendent, Buenos Ayres Great Southern and Buenos Ayres Western Railways, 1940-46

Mr. Jakob Bertschmann, Superintendent, Traction & Mechanical Workshop Department, Rhaetian Railway, Switzerland, who, as recorded in our January 4 issue, has retired, joined the Railway as Chief Electrical Mechanic, 39 years ago. During his term of office Mr. Bertschmann has not only given attention to efficient working of the Rhaetian Railway, but has also made valuable contributions to the improvement and standardisation of its electrical equipment. In the years following the first world war he was responsible for complete electrification of the Railway, then 140 miles of track, and supervised the instruction of the existing steam-locomotive staff in electric working. When, in 1942, the Bernina Railway, the Chur-Arosa Railway and the Bellinzona-Mesocco Railway, totalling 73 miles of predominantly mountain routes, were absorbed, he undertook renovation of their electrical equipment. For the Chur-Arosa line, which operates at 2,000 v. and the Bernina line, at 1,000 v. d.c., he has designed a railcar which may be used, in winter on one Railway and in summer on the other, as circumstances require.

Mr. Alfred Baechtiger, formerly Superintendent of the Central Workshops & Traction Department, City of Zürich Electric Tramways, Switzerland, who, as recorded in our January 4 issue, has been appointed as Superintendent of the Traction & Mechanical Workshop Department of the Rhaetian Railway, had been in the service of the City of Zürich Electric Tramways for a number of years. After holding various positions with that undertaking, he subsequently became Superintendent of the Central Workshops & Traction Department and relinquished that post on his appointment to the Rhaetian Railway.

Mr. T. B. Stewart, O.B.E., Commercial Superintendent, Buenos Ayres Great Southern and Buenos Ayres Western Railways, 1940-1946, whose death we recorded briefly in our January 11 issue, had been actively connected with British-owned Argentine Railways since January, 1910, when he joined the staff of the Railway Clearing House in Buenos Aires. After serving as Chief of the Tariff Section, he was appointed Chief of the Hotels & Refreshment Department of the Buenos Ayres Great Southern Railway in 1918. In 1928 he was promoted to be Assistant to the General Manager in charge of Staff & Labour matters in addition to occupying the position of Chairman of the Labour Advisory Committee of all the foreign-owned railways in the Argentine. In 1936 he was appointed Traffic Manager, Buenos Ayres Great Southern and Buenos Ayres Western Railways, and he became

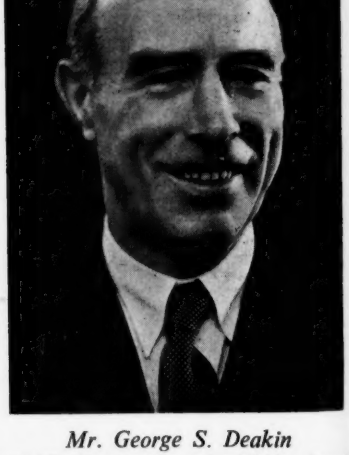


*Mr. L. E. Marr*

Appointed Manager, Clyde Shipping Services, Scottish Region, British Railways

*Mr. H. T. G. Miller*

Assistant to Commercial Superintendent (Passenger & Parcels Traffic), Western Region, 1948-51



*Mr. George S. Deakin*

Head Office Representative, Paints Division, Imperial Chemical Industries Limited, who is relinquishing contacts in the transport industry

Commercial Superintendent for the two Railways in 1940. Mr. Stewart retired in 1946.

Mr. L. E. Marr, O.B.E., Assistant Commercial Superintendent, Scottish Region, who, as recorded in our January 11 issue, has been appointed Manager, Clyde Shipping Services, joined the North Eastern Railway in 1922, and after a period of training, was appointed to the staff of the District Goods Manager, Newcastle-on-Tyne, in 1926. Following experience at Middlesbrough and in the Passenger Manager's Office, York, he was appointed Assistant Goods Agent, Newcastle, in 1929, and Assistant District Goods & Dock Manager, West Hartlepool, two years later. In 1933 he became Assistant District Passenger Manager, London, and in the following year went to York as District Passenger Manager. He was mobilised in August, 1939, with No. 1 Docks Group, Royal Engineers (S.R.), and commanded the Group on proceeding to France early in September of that year. Subsequently he served with R.E. Transportation in the Middle East, India, and West Africa, and later held the appointment of Colonel, Deputy Director Tn. (Ports & Inland Waterways) with S.H.A.E.F. During his service he received the O.B.E., American Bronze Star Medal, and was mentioned in dispatches. On demobilisation in 1945, Mr. Marr took up the appointment of Passenger Manager, Scottish Area, L.N.E.R., and in 1948 he became Assistant Commercial Superintendent, Scottish Region. In his new appointment Mr. Marr will deal with the operation and efficiency of the Clyde Services in relation to public needs.

Mr. H. T. G. Miller, M.M., A.M.Inst.T., who retired from the position of Assistant to the Commercial Superintendent (Passenger & Parcels Traffic), Western Region, last year, was recently presented with a cheque subscribed by Heads of the Passenger Sections and Staff of the Commercial Superintendent's Office. The presentation was made by Mr. C. Furber, Commercial Superintendent. Mr. Miller joined the G.W.R. in 1904, and after station experience, was transferred to the office of the Divisional Superintendent at Bristol. In 1922 he was appointed Passenger Outdoor Representative in the Worcester Division and in 1934 moved to the Paddington headquarters, in charge of the Passenger Claims Section. He became Head of the Passenger Rates Section in 1945, and three years later was appointed Assistant to the Commercial Superintendent (Passenger & Parcels Traffic). Mr. Miller served overseas with the Forces during the 1914-18 war, when he was awarded the Military Medal. In 1946 the King sanctioned his appointment as Serving Brother, Venerable Order of St. John of Jerusalem.

Mr. George S. Deakin, O.B.E., Assoc. Inst.T., Head Office Representative to the Transport Industry for the Paints Division of Imperial Chemical Industries Limited, has been appointed to a wider sphere of responsibility in connection with overseas interests of the company, and is relinquishing contacts in the transport industry. His association with transport dates from 1930 and he had been Head Office Representative to the Transport Industry for Imperial Chemical Industries Paints Division since 1938, and also for Railways since 1948. Mr. Deakin was awarded the O.B.E. (Military) in December, 1944, for service with a Home Guard anti-aircraft battery. He became an Associate of the Institute of Transport in 1950.

Mr. P. R. Scutt, formerly Director of Production at Tecalemit Limited, is now Director & General Manager.

Mr. Norman E. Carlson has been appointed Assistant Chief Mechanical Engineer of the American Car & Foundry Company.

We regret to record the death on December 24, at the age of 89, of Mr. Frank Scott, a former Vice-President and Treasurer of the Grand Trunk Railway, Canada.

The North Eastern Region has announced the appointment of Mr. W. J. Thomas as Stationmaster at Darlington. He has been Stationmaster at Harrogate since December, 1949.

We regret to record the death on January 4 of Mr. F. L. Welch, who retired in 1948 as Head of the Metals Purchasing Section of the Stores Superintendent's Department, London Midland Region.

Mr. H. J. Sneath, Assistant Foreign Freight Agent, Canadian National Railways, has been appointed Foreign Freight Agent, with headquarters at Montreal, in succession to Mr. John Gleave, who has retired.

We regret to record the death on December 23, at the age of 79, of Mr. W. W. Colpitts, Governor of McGill University, and one of the leading United States authorities on rail transport. He was a partner in the firm of Coverdale & Colpitts, Consulting Engineers, of New York.

C. C. Wakefield & Co. Ltd. has announced the appointment of Mr. Alonzo Limb as sole Managing Director. Previously, he had shared the responsibilities of this post with Mr. Walter H. Senneck, who has now retired. Mr. Senneck will retain a seat on the board. Messrs. William F. List and Leonard M. Broadway have been appointed Assistant Managing Directors.

### Scottish Region Appointments

British Railways, Scottish Region, has announced the following appointments:—

Mr. John Simpson, Commercial Superintendent's Office, Glasgow, to be Assistant to District Goods Superintendent, Glasgow.

Mr. A. G. Webster, Assistant Goods Agent, Glasgow (High Street/College), to be Goods Agent, Glasgow Buchanan Street.

### London Midland Region Appointments

The following appointments are announced by the London Midland Region:—

Captain J. D. Reed, Executive Officer (Marine), Railway Executive headquarters, to be Manager (Irish Shipping Services), Euston, in place of Captain W. L. Sinclair, retiring (reorganisation and position redesignated).

Mr. G. W. Miller, District Motive Power Superintendent, Skipton, to be District Motive Power Superintendent, Bescot.

Mr. N. Powell, Divisional Freight Controller, Manchester to be District Operating Superintendent, Rugby.

Mr. S. A. S. Smith, Assistant Works Manager (Locomotive Outdoor Machinery & Electrical), Swindon, Western Region, to be Locomotive Works Manager, Horwich.

Sir John Woods has been appointed a Director of the English Electric Co. Ltd.

### R.E. (R.O.D.) Annual Dinner

The annual Officers Reunion Dinner of the Royal Engineers (Railway Operating Division) will be held at the Transportation Club, London, on February 29. Colonel V. M. Barrington-Ward will be in the chair.

Mr. W. H. Platt, Assistant Sales Manager (Wrought Products), British Aluminium Co. Ltd., retired on December 31, 1951. Mr. C. F. Batstone will combine the functions of Principal Assistant Sales Manager with those previously carried out by Mr. Platt and will have the title Assistant Sales Manager (Wrought Products).

Due to the expansion of the company's business during the past few years, and to share the increased duties devolving on the present Managing Director, Mr. Montague Burningham, the board of Keith Blackman Limited has appointed Mr. D. S. Woodley to act as Joint Managing Director with Mr. Burningham. Mr. Woodley was appointed Chief Engineer in 1931, and became Deputy Chairman in 1950. Consequent on this new appointment Mr. S. E. Nelson will succeed Mr. Woodley as Chief Engineer of the company.

Mr. S. W. Bainbridge, who, as recorded in our December 7 issue, has been appointed Principal Information Officer in charge of the Information Branch (formerly Division), Ministry of Transport, began his career as a journalist on the *Birkenhead News* in 1918. From 1928 to 1934 he was a member of the editorial staff of the Central News Agency and was for several years a Parliamentary lobby journalist and member of the Press gallery. Mr. Bainbridge has been a member of the Information staff of the Ministry of Transport since 1934.

The first term of office of the Central Transport Consultative Committee for Great Britain having expired on December 31, 1951, the Minister of Transport has appointed the following to be members of the Committee until December 31, 1954 (except where otherwise provided):—

*Chairman*: Major Egbert Cadbury.

*Members*:

Representing agriculture: Messrs. David Lowe, A. G. Wright.

Representing industry and commerce: Messrs. A. G. Marsden, R. H. E. Thomas, C. E. Jordan.

Representing shipping: Mr. A. I. Anderson.

Representing labour: Sir Luke Fawcett, Mr. W. B. Beard, Mr. C. E. Prater.

Representing local authorities: Sir Robert Pattinson, Sir John Carew Pole, Alderman T. W. Bridgland, Councillor J. P. Collins.

Representing the British Transport Commission: Lord Rusholme, Mr. M. A. Cameron.

*Additional Members*: The persons for the time being holding the appointment of Chairman of the Transport Users Consultative Committee for Scotland and for Wales.

All except Mr. C. E. Jordan and Mr. A. I. Anderson were previously members of the Committee. The Secretary of the Committee is Mr. G. Cole Deacon.

Two further members representing industry and commerce and local government have yet to be appointed.

# New Signalbox at Carlisle Citadel, L.M.R.

*Up-to-date structure and layout now in use at the south end of station*

A new signalbox has recently been built at Carlisle Citadel, London Midland Region, to replace the former No. 5 box which, because of its age, required excessive maintenance and could not be satisfactorily altered to operate the new remodelled layout which had been installed.

The new installation, erected on the down side of the line south of the former signalbox, controls the south end of the Citadel Station where three lines converge, those from Crewe, Leeds (and Newcastle), and Maryport.

A new 140-lever frame at 4½ in. centres has been provided. It is mounted directly on the operating floor with separate counterbalance and electric lock connections beneath. The tappet interlocking is actuated by the catch handles, and the frame is mounted so that the signalmen have an unobstructed view of the running lines. The lever handles have white plastic covers.

*New 140-lever frame mounted directly on the floor*

Two black-and-white plastic illuminated track diagrams have been installed, with an instrument shelf on which the colour-light signal repeating lamps, point indication lamps, and so on, are mounted. A panel with coloured lamp indications has been used in place of the usual needle-type block telegraph instruments. Provision has been made in the lever frame for working the additional connections and signals required if a new down through line were provided through the station.

New colour-light down home signals have been installed, with position-light calling-on signals (also showing an illuminated letter "C"), theatre-type route indicators and miniature yellow aspects for running movements to sidings. There is only one lever for each of these signals, but a selector lamp above the lever shows the signalman which route has been set up. The calling-on signals are selected by the platform track circuits being occupied.

The running lines ahead of these signals have been track circuited as far as the down home signals for Carlisle No. 4A signalbox, in the middle of the station. Thirty track circuits have been installed in all, and in consequence most of the facing point lock bars have been replaced by track circuit control. Certain point levers have also been locked by track circuit.

### Ground Signals

Mechanically-operated ground signals precede any running signal applicable to the same route. The ground signals electrically detect any points already so fitted for running movements; other points are detected mechanically. There is much shunting at Carlisle No. 5 and the number of ground signals has been considerably increased; single-arm signals have been used without indication of the destination. To assist shunting there are two-way loudspeakers between the signalbox and positions on each side of the station.

All the signals reading into the station are electrically released by the next signalbox (No. 4A), as the down lines are also arranged for up working. To allow simultaneous movement from either end into a platform which is already occupied, this control is rendered unnecessary after the platform track circuits have become occupied for a given period. A further point of interest is that there is one movement from a down line to the up platform No. 4, for which the subsidiary signal is given at the home signal, qualified by "X4," the "X" showing that it is a movement on to a line in the wrong direction.

The signalbox is centrally heated by a gas-fired boiler, and has a kitchen with mastic asphalt flooring, Belfast sink, and draining board with white glazed tile surround. The steel windows, glazed with plate glass, occupy the length of the front and ends of the box.

Walls throughout are solid and constructed in Calsil sand-lime bricks in gauged lime mortar; the facings are a stone colour. All roofs are flat, with low surrounding parapet, and consist of pre-cast cinder concrete lightweight blocks laid dry between pre-cast concrete filler joists, then topped with a concrete screed laid to falls and covered with two layers of two-ply bitumen roofing felt bonded together; the top layer is machine finished with mineral surfacing as a protection against sparks.

## Special Wagons for Iron-Ore Traffic

(*Concluded from page* 74)

anticipated that it will be possible for all the manually-operated locks to be released as the train slowly passes a predetermined position. If this does not work out it may be necessary for the train to stand for a few minutes to allow this operation to take place. This will leave the doors being held by the air-operated gear only.

6. Discharge wagons by operating the three-way valve on the engine, which will cause a transfer of air from the 14-in. dia. cylinders to the 16-in. dia. cylinders, and together with additional air from the reservoirs, will cause the doors to open.

7. Close doors by placing handle of the three-way valve in another position which will allow the air in the 16 in. dia. cylinders to exhaust to atmosphere and air from the reservoirs to enter the 14 in. dia. cylinders. Move train from discharge point.

8. Operate manual lock to keep doors in closed position. If this cannot be done with the train moving slowly, it will again be necessary for it to stand for a few minutes.

9. Proceed back to loading point. During the journey the compressors on the locomotive should be creating the necessary air pressure to enable the series of operations to take place again.

# Electric and Diesel-Electric Traction Progress, 1951

*Some important home and overseas orders placed for B.T.H. railway equipment*

All the commercial and engineering departments of the British Thomson-Houston Co. Ltd. have been actively engaged during the past twelve months on work associated with orders for plant and equipment—from large turbo-alternators and alternators for hydro-electric schemes to small power motors and lighting fittings—as well as on the development of new products of all kinds. Factories have been operating to capacity, within the limits imposed by restricted raw materials and availability of labour, while extensions and the development of new methods and techniques have increased the manufacturing potential of the firm.

### Diesel Locomotive Orders

The past year has been marked by a further advance in the diesel-electric locomotive field, and the 165-h.p. Ruston & Hornsby and the 300-h.p. Yorkshire Engine Company locomotives with B.T.H. electrical equipment have already done good work. Further sets have been ordered. The 827-h.p. mixed-traffic locomotive in the London Midland Region of British Railways has operated satisfactorily on a wide range of duties.

The 24 two-car sets for the Western Railway, India, the traction equipment for which is being supplied and erected by B.T.H., are nearing completion and several of the coaches have already been shipped to India. The equipment, which is for operation at 1,500-V., includes electro-pneumatic camshaft control, generally similar to that developed for London Transport trains of which 1,280 equipments have now been supplied.

Progress has also been made on the ten 1,000-h.p. diesel-electric locomotives for the New South Wales Government Railways, and on the 18 shunting locomotives for Western Australia, of which delivery is due to commence this year. An experimental generator for a main-line diesel-electric locomotive has been built and tested in conjunction with a Ruston-Paxman 1,500-h.p. 12 YLXL engine.

Of the smaller diesel-electric locomotive orders the British Thomson-Houston Co. Ltd. has commenced shipment of the five diesel generator sets using A.E.C. engines which are being supplied for the conversion of small battery locomotives on the New Zealand Government Railways. Work is also proceeding on two diesel-electric railcars for Bolivia and the mechanical parts for these are being made by D. Wickham & Co. Ltd.

Orders for P.C.M. camshaft control equipment for motor coaches for London Transport and for the Western Railway, India, have been completed during the year. Another order for 750 sets of railway motor gears has been received from the Victorian Government Railways and follows an order for 200 sets now in course of delivery.

An important contract for the Southern Region of British Railways covers approximately 100 Class "MF36" 33 kV. 750 MVA. single-phase horizontal-draw-out Metalclad units for installation in 20 substations.

### Rectifiers for Overseas Railways

An order from the Department of Railways, New South Wales, covered fifteen 4,000 kW., 1,500-V. cubicle type rectifier units for the Sydney-Lithgow section, which climbs to over 3,500 ft. and has gradients up to 1 in 33. The system is designed to handle very heavy goods trains travelling down into Sydney under regenerative braking control. Energy generated, which cannot be used by other trains will be dissipated in resistors located at selected substations, and the British Thomson-Houston Co. Ltd. is to supply three 7,700 kW. and two 3,744 kW. resistor banks with associated control gear for inserting instantaneously, by electronic control, sections of the resistance as needed.

Most of these rectifiers are for the new section being electrified, and two are required to strengthen an existing substation in the Metropolitan area of Sydney. These rectifiers will be compensated by grid control for parallel operation with existing rotary converters of B.T.H. make.

A complete plant for a substation to contain four 1,200 kW. 630 V. pumpless cubicle type rectifier units has been ordered by the London Transport Executive. This equipment will embody new features evolved by B.T.H. in conjunction with the L.T.E. The use of oil-immersed transformers is undesirable in densely built-up areas, and with direct air-blast cooling the transformer windings are liable to become choked with dust. Windings are therefore to be cooled by air in a closed circuit and the transformer tanks have air-to-air cooling tubes.

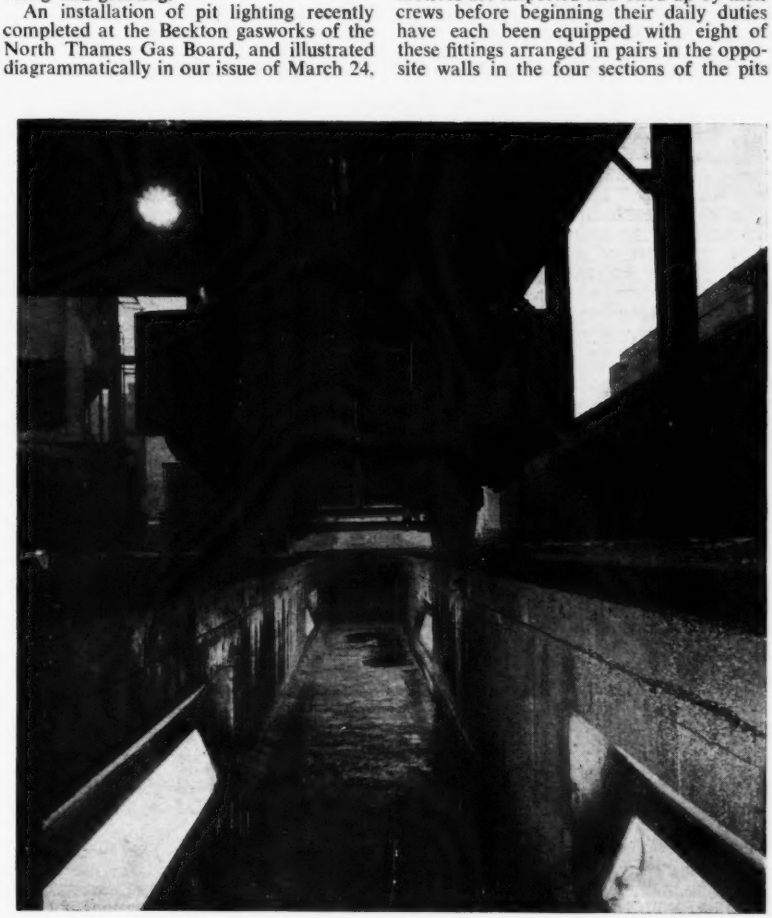
# Locomotive Pit Lighting Equipment

*Designed to protect fittings from dripping oil and water*

In applying the advantages of fluorescent lighting in locomotive inspection pits, one of the problems encountered is the protection of fittings from oil and water dripping down the side walls of the pits. At the same time it is necessary to throw the light upwards to the underside of the locomotives to provide adequate illumination for oiling and greasing.

An installation of pit lighting recently completed at the Beckton gasworks of the North Thames Gas Board, and illustrated diagrammatically in our issue of March 24, 1950, demonstrates a method of overcoming these difficulties by the use of fittings specially designed for such applications by the General Electric Co. Ltd. The gasworks has its own internal railway system, about 100 track-miles, and 40 steam locomotives.

Two pits in a running shed where locomotives are inspected and oiled up by their crews before beginning their daily duties have each been equipped with eight of these fittings arranged in pairs in the opposite walls in the four sections of the pits



*Recessed arrangement of lighting fittings in locomotive inspection pit at Beckton*

where most of the work is carried on. The fittings have inclined front glasses and polished aluminium angle reflectors for directing the light upwards into the mechanism. They are recessed behind the face of the side walls, and a groove is arranged in the upper part of each concrete enclosure, so that the front glasses are protected from oil and water dripping from the locomotives.

The armour-plate front glass is attached to the heavy-gauge steel body of the fitting by twelve bolts and the joint is sealed by a rubber gasket to exclude oil and water. Each fitting accommodates one 5-ft. 80-W. lamp.

Since this lighting was installed it has been unnecessary for the crews to use headlamps when oiling up their engines. The level of illumination on the motion and other parts right up to the underside of the boiler, and the freedom from shadow achieved by the use of an elongated light source, are features which are of great assistance in the work of daily inspections.

## Institute of Transport, Southern Section

An address entitled "Life in two Regions of British Railways" was given by Mr. C. P. Hopkins, Chief Regional Officer, Southern Region, to the Southern Section of the Institute of Transport, under the chairmanship of Mr. R. P. Biddle, Docks & Marine Manager, Southampton, on January 9.

As, before being transferred to the Southern Region two years ago, Mr. Hopkins was Chief Regional Officer in the North Eastern Region for two years, he was well qualified to compare the two Regions. He drew attention to the similarity of route and track mileages and to the number of staff employed in each Region. The North Eastern Region had important heavy industries apart from the light industries of many trading estates; the Southern Region on the other hand had little heavy industry. The Southern shared in the industrial work of the Thames Estuary, and served the Kent coalfield, but the majority of places on its long coastline were primarily pleasure resorts, although among them were the packet ports, important to railway business. In 1950, 76 per cent. of the North Eastern business came from freight, and no less than 80 per cent. of the Southern's from passengers.

### Southern Suburban Traffic

After explaining that the Southern preponderance in passenger traffic was because much of suburban London was served by its system, Mr. Hopkins gave figures indicating the size of the task of handling the hundreds of thousands of passengers using the Southern termini daily, and interesting facts about the electrified areas. He quoted significant figures for both passenger and freight trains in the Southern Region, and emphasised that as freight trains had to be operated over the same rails as an intensive passenger service, a high standard of timekeeping was essential.

Other subjects covered in Mr. Hopkins's address were the ports in the two Regions; Cross-Channel services; the importance of informal staff conferences at four or five suitable centres in the Region; and the problems confronting the technical departments.

## Staff & Labour Matters

### British Railways Staff Association

British Railways have announced the formation as from January 1, 1952, of a Staff Association open to all railway staff, their wives and dependent children, retired staff, and widows of railwaymen. Where practicable, facilities will be available to the staffs of the other Executives of the British Transport Commission.

The new association will offer at small cost wide scope for the organisation of all the customary kinds of sport and recreational and social activities. It is planned eventually to stage competitions on a Regional basis and, through the Joint Advisory Council for Welfare, on a national basis. Membership will be voluntary; most of the proceeds of the 4d. weekly subscription will be used by branches for local activities, and the rest for Regional activities and administration, and to help smaller branches.

### Organisation and Management

Standard rules for all Regions give members maximum responsibility for management of association affairs. In the chain of organisation the members will be represented on Branch Committees and Area and Regional Councils. Athletic clubs and other social organisations already established throughout British Railways will be invited to ally themselves with the association.

In developing staff welfare, British Railways recognise that full regard must be given to the provision of social and recreative amenities; also that there should be co-ordination of social and recreative interest in the Regions so as to provide common ground on which staff of all grades can meet.

## Contracts & Tenders

In our January 4 issue an article on the $8,000,000 contract for 104 57-ft. subway cars for the new Toronto subway system, placed with the Gloucester Railway Carriage & Wagon Co. Ltd. by the Toronto Transport Commission, Canada, last year, reference was made to the bogies, which will mount two propeller shaft driving motors, with Hypoid gear axle units, manufactured by David Brown & Sons (Huddersfield) Ltd.

An order for 416 gearboxes for these two-car sets has been received by David Brown and the gearboxes will be similar to, though larger than, the units which the company has supplied in recent years to a number of public transport undertakings in Western Europe and Scandinavia. This Canadian order is one of the largest of its type ever to be received by the Huddersfield firm.

The New Zealand Government Railways Road Services have placed a contract with Leyland Motors Limited for 20 Comet "90" long-wheelbase models. The Comets will be fitted with bus and coach bodies, and will be stationed at various depots throughout New Zealand.

The following contracts have been placed by British Railways, London Midland Region:—

Henry Hope & Sons Ltd., Birmingham: patent aluminium roof glazing for Camden "B" goods shed; renewal of the roof coverings (stage 3), with patent glazing, of Euston down side carriage shed.

Concrete Piling Limited, London, S.W.1: construction of R.C. stores building at Derby locomotive works.

Demolition & Construction Co. Ltd., London, S.W.1: removal of existing roof coverings at Manchester Central Station.

Thos. Collier & Sons Ltd., Leigh: removal of existing roof coverings at Stockport Edgeley carriage shed; renewal of the roof and alterations to the special road vehicle shop and iron stores at Earlestown wagon shops.

The Government of Pakistan is inviting tenders for the supply of 11,456 tons of steel rails, complete fishplates, fishbolts with nuts, dogspikes and bearing plates, for the North Western Railway. Further details are given under Official Notices on page 83.

According to a report by the Board of Trade Special Register Information Service, the closing date for the receipt of tenders for electrification of the Santa Maria-Cruz Alta line, Rio Grande Do Sul Railway, Brazil, has been postponed from January 22 to March 21. The tender was referred to in our November 16, 1951, issue.

The closing date of the call for tenders (No. 2226), issued by the Department of Railways, New South Wales, for the supply of locomotive boilers, is reported to have been extended from 12 noon on Wednesday, January 16, to 12 noon on Wednesday, February 20. Reference to the tender was previously made in our November 30, 1951, issue.

The Board of Trade Special Register Information Service recently stated that a call for tenders (No. A.3789) has been issued by the South African Railways for the supply of track jacks as follows:—

240 track jacks, Type "A"
234 track jacks, Type "B"

The jacks are to be supplied complete with lifting handles and must conform to specification CCE.2/20-1950 (as amended November, 1950), to which diagram RD209, illustrating clearances for Type "B" jacks, is attached.

Tenders must reach the Chairman of the Tender Board, Johannesburg, before 9 a.m. on Thursday, February 7. A copy of the tender documents is available for inspection by representatives of United Kingdom manufacturers at the Board of Trade, Commercial Relations & Exports Department.

A further report from the Board of Trade Special Register Information Service states that the closing date of the call for tenders (No. ME.1295) issued by the Commonwealth Railways, Australia, for the manufacture, supply and delivery of wagon bodies and underframes (without bogies), has been extended from 4 p.m. on January 15 to 4 p.m. on February 12. The tender was previously referred to in our December 14, 1951, issue.

VAN SWERINGEN END.—The recent dissolution of the Vaness Company in the United States was the end of the old Van Sweringen "railroad empire" which at one time controlled 80 railways. Vaness was the key holding company, and was used as the liquidating agent by the U.S.A. authorities. Unpaid debts written off by order of the U.S.A. courts totalled $61 million; but of this $53 million were due to the banking house of J. P. Morgan, which had years ago advanced money to the Van Sweringen brothers.

# Notes and News

**Vacancy for Draughtsman.**—The Gloucester Railway Carriage & Wagon Co. Ltd., Gloucester, have a vacancy for a draughtsman. See Official Notices on page 83.

**Graduate Electrical Engineers.**—Graduate electrical engineers between 25 and 30 years of age are required to be trained as designers of electrical equipment for diesel-electric locomotives. See Official Notices on page 83.

**London Transport Dramatic Club.**—The London Transport Dramatic Club is giving two performances, on February 1 and 2, of Charlotte Hastings' play "Bonaventure," at the Cripplegate Theatre, Golden Lane, E.C.4, at 7 p.m.

**Steel Furnaces Closed.**—The shortage of scrap metal supplies has caused three open-hearth furnaces to shut down at the Margam and Port Talbot Steel Works, South Wales. Each had a weekly production capacity of 1,000 tons. As a result of the closure, all iron-ore trains from the ironstone works at Banbury have been cancelled.

**Institute of Transport Visual Aids Study Group.**—A meeting of the Visual Aids Study Group of the Institute of Transport will be held on Monday, January 21, at 5.45 p.m. at 80, Portland Place, London, W.1. The programme will include three films: "Absolute Block Signalling" and "Berth 24," both lent by the British Transport Commission, and "First Principles of the Petrol Engine," lent by the Petroleum Film Bureau. One other meeting of the Group has been fixed for March 31, and members of the Institute and their friends are invited to attend both meetings.

**Western Region Branch Lines Closed.**—Train services between Uffington and Faringdon, Berkshire, and between Craven Arms and Much Wenlock, Shropshire, in the Western Region of British Railways were discontinued on December 31 for economic reasons. The 3½-mile line from Uffington to Faringdon was opened in June, 1864, and has been served by six trains in each direction daily. Alternative bus services are available to Faringdon from Swindon, Uffington, and Challow. The 14 miles of line between Much Wenlock and Craven Arms also has been served by three trains daily in each direction. Longville and Presthope stations and Easthope and Westhope halts will be closed. An alternative bus service will be operated.

**Progress of W. G. Bagnall Limited.**—Among the steam locomotives despatched from the Castle Engine Works of W. G. Bagnall Limited during 1951 were three 0-6-OT shunters for the Western Region of British Railways, three 0-6-OT shunters of special design for the Steel Company of Wales Limited, two 0-4-0 fireless locomotives for the British Electricity Authority, six 4-8-0 tender engines for the Ceylon Government Railway, five 4-6-0 metre-gauge tender locomotives for India, and a number of industrial type shunters. Five 0-6-0 diesel-electric shunters were built for Brush Bagnall Traction Limited, four to the order of the Steel Company of Wales Limited, and one for Lever Bros. A number of frames and bogies for the main-line A-1-A and A-1-A diesel-electric locomotives ordered by the Ceylon Government Railway have been supplied to the Brush Bagnall Traction shops at Loughborough where the 25 locomotives will be erected. Work on a large new erecting shop, equipped with 50-ton cranes, was commenced in 1951, and other buildings completed are a new office block, an extension to the wheel shop, and a new works inspection shop. Among new machine tools installed are a Waldrich openside planer, a Schmaltz axle grinder, a 60-in. Webster Bennett boring mill, and a Schmaltz segmental wheel surface grinder and a number of lathes. A new 450-ton upstroking flanging press built by Fielding & Platt Limited is now being installed.

**Canadian Railwaymen's Wage Request.**—Canadian railway unions sent their leaders to Ottawa on January 9 to request Government help in obtaining an interim but unstated wage increase for 125,000 members. Regular wage negotiations will begin in the late summer, when two-year wage contracts are due for renewal or revision. The Minister of Labour assured the delegation that its request will be considered by his department, but did not promise to take it up with the Government.

**Steel Production in 1951.**—The British Iron & Steel Federation announces that production of steel ingots and castings in 1951 amounted to 15,638,500 tons, a fall of 654,000 tons from the 1950 record total of 16,292,700 tons. Between November and December last, the rate of output dropped from 16,437,000 to 14,953,000 tons, compared with 15,408,000 tons in December, 1950. A small increase was achieved in the 1951 output of pig-iron, which rose from 9,632,900 tons, in 1950, to 9,668,800 tons. Total steel output in 1951 fell short of the forecast, in April, of 16 million tons, though it is stated that, if production of iron castings had not exceeded the level of 1950, and used more scrap in doing so, the steel industry would have had sufficient scrap to produce approximately the 16 million tons previously estimated. The B.I.S.F. hopes that, if various conditions are fulfilled, output of steel may reach 16 million tons in 1952.

**New Rhodesian Line Begun.**—Work has begun on pegging out the new line from Bannockburn (Rhodesia) to the Rhodesian-Portuguese East African border, where it will meet a line from Guija to Lourenço Marques. Digging will start as soon as the rains loosen the ground.

**Leopoldina Payments.**—Payments to the 6½ per cent. debenture stockholders of the Leopoldina Railway Co. Ltd. and the 5 per cent. debenture stockholders of the Leopoldina Terminal Co. Ltd. under the schemes of arrangements in connection with the sale of the undertaking of the railway company and the Brazilian shares of the terminal company will be made on and after February 12. The transfer to the debenture stockholders of the terminal company of £70 ordinary stock will also be made on and after the same date.

**Southern Region Rebuilt Multiple-Units.**—The first of the standard rebuilt multiple-unit suburban four-car trains shortly to be placed in service in the Eastern Section of the Southern Region of British Railways, was inspected at Waterloo Station on January 14. Those present included Mr. John Elliot, Chairman, Railway Executive; Messrs. V. M. Barrington-Ward, David Blee, R. A. Riddles, J. C. L. Train, and General Sir Daril G. Watson, Members, Railway Executive; and Messrs. C. P. Hopkins, Chief Regional Officer; T. E.

## Southern Region Motor Drivers School

*Two pupils being instructed in the mobile school for road motor drivers of the Southern Region, described in our November 9, 1951, issue*

Chrimes, Motive Power Superintendent; S. W. Smart, Superintendent of Operation; H. H. Swift, Mechanical & Electrical Engineer, Southern Region. Further reference to the trains is made in an editorial note this week.

**Felix Hotel Sold.**—The Hotels Executive announced recently that it had disposed of the Felix Hotel, Felixstowe, formerly owned by the G.E.R. and its successor, the L.N.E.R. Bookings for accommodation cannot be accepted after January 31.

**Peruvian Corporation Limited.**—Required for the Southern Railway of Peru a subaccountant with experience of railway accountancy, and preferably with a knowledge of the Spanish language. See Official Notices on page 83.

**Western Region, London Lecture & Debating Society.**—Mr. W. N. Pellow, Motive Power Superintendent, Western Region, will read a paper on "The Work of the Motive Power Department," at a meeting of the Western Region London Lecture & Debating Society to be held in the Clerks' Dining Club, Bishop's Bridge Road, W.2, at 5.45 p.m. on January 31.

**Institute of Transport, Metropolitan Section.**—At a meeting of the Institute of Transport, Metropolitan Section, to be held at 80, Portland Place, W.1, at 5.30 for 6 p.m. on February 4, there will be a symposium on "Railway Transport in the U.S.A.," by Mr. A. Dean (Engineering), F. Gilbert (Labour), S. G. Hearn (Operating), and A. C. B. Pickford (Commercial).

**Tourist Trade in 1951.**—About 700,000 overseas visitors came to Britain last year and contributed more than £100,000,000 to the national economy, compared with £76,500,000 in 1950. Of the total, about £70,000,000 were spent within Britain, including £14,000,000 on internal transport by rail, road, and air. In giving these figures in a review of the tourist industry given to the Institute of Transport on January 14, Mr. E. L. Taylor, Deputy Chairman of the British Travel & Holidays Association, said that the wealth of public transport services to every corner of the land made this country the most easily accessible in the world. Our tourist trade could still be greatly expanded; in particular the hotel industry would benefit from an easing of the burdens imposed by restrictive legislation.

**Institution of Civil Engineers.**—At a meeting of the Institution of Civil Engineers, Great George Street, S.W.1, to be held at 5.30 p.m. on January 29, there will be a discussion on "Continental Railway Civil Engineering Practice." There will be papers on "Observations on a Visit to French Railways in 1949," by Mr. R. G. Thurtle, and "Observations on a Visit to the Netherlands Railways in 1950," by Mr. J. G. F. Inglis.

**Associated Electrical Industries Issue.**—Associated Electrical Industries Limited is to raise £6,652,947 by offering 2,217,649 of £1 ordinary shares at 60s. each to ordinary stockholders, on a one-for-three basis. The issue will be subject to the approval, at an extra-ordinary meeting on January 31, of resolutions to increase the capital to £18 million by the creation of a further 5,000,000 ordinary and 3,000,000 unclassified £1 shares. Sir George E. Bailey, Chairman, points out that this is more than will be required at present, and will provide for future issues if and when these are considered desirable.

**New London Transport Uniform.**—New uniforms will be issued this year to all London Transport bus, trolleybus, tram, and coach drivers and conductors. There will be a new lightweight dust jacket for summer wear, designed to give more comfort in hot weather. It is of light grey duck material, and collar and cuffs have dark blue facings. Because of the lightweight jacket all conductors on London buses will receive leather cash bags instead of the present reinforced cash pockets in their jackets. Cash bags were withdrawn by London Transport 15 years ago, but the new dust jackets would not be suitable for fitting a reinforced pocket. There is also a new serge jacket, similar in style to the present one except that it has no cash pocket.

**Rhodesia Railways Trust Limited.**—The directors of the Rhodesia Railways Trust Limited announce an unchanged dividend of 9 per cent., less tax, on its £2,005,767 capital for the year ended September 30, 1951. The preliminary statement shows profits totalling £107,371, against £102,292, after allowing for tax of £112,125, against £94,752.

**Clyde Steamer Services.**—The principal changes in the revised timetable for the Clyde Coast steamer services in operation from January 14 are: Restoration of the 6.45 a.m. service from Rothesay to Gourock *via* Innellan and Dunoon, and return evening service; 7.30 a.m. steamer from Rothesay leaves at 7.45 a.m. and sails direct to Wemyss Bay; 10.30 a.m. steamer from Rothesay to Wemyss Bay leaves 15 min. earlier and call at Innellan; service from Kirn to Gourock at 7.33 a.m. daily and evening service from Gourock in connection with the 5.20 p.m. (N.S.) train from Glasgow Central.

**Glyn, Mills & Company.**—A final dividend of 7½ per cent., the same as last year, is proposed by Glyn, Mills & Company, making, with the interim of a similar amount, a total of 15 per cent., less tax, for 1951, which also is the same as for the previous year. The profit for the year, after allowing for taxation and making a transfer to reserve for contingencies out of which account provisions are made for all bad and doubtful debts, fluctuations in the value of investments, and other contingencies, amounted to £185,284, as compared with £186,540 for 1950. After directors' remuneration of £36,405 (£35,034) the balance was £148,879, against £151,506 last year. An additional sum of £50,000 (same) has been transferred to reserve for contingencies, and after payment of the dividend for the year of £83,476, against £87,450, there remains a balance of £63,403, against £48,000, to be carried forward.

**Competition for Locomotive Men: Trip to France as Prize.**—The Railway Executive is organising a competition in which locomotivemen's mutual improvement classes in each of the 65 Motive Power Districts will enter teams of six men, of whom not less than three are to be under 30 years of age; they will compete in answering questions on locomotive topics addressed to them in turn by a question master (usually the District Motive Power Superintendent). The winning teams in each District will then compete on an area basis and the area winners will be the finalists in an all-line competition. Question masters in the later rounds will be selected from a neutral source. Railwaymen not competing will be invited to form audiences. The object is to stimulate interest in efficient locomotive working and to enable the locomotive staff of various Districts to pool their knowledge and experience. It is proposed

## South African Railways Window Display

*A display in the window of South Africa House, London. On the left is a reproduction of a painting of a typical South African main-line train; the photograph shows the "Blue Train" leaving Cape Town, and the model is of a Class "16E" locomotive*

# OFFICIAL NOTICES

GOVERNMENT OF PAKISTAN. Ministry of Communications (Railway Division). Tenders are invited for the supply of 11,456 tons Steel Rails 90 lb. 'R' Flatfooted 42 ft. long complete with fishplates, fishbolts with nuts, dogspikes and bearing plates required by the North Western Railway during the year 1952-53. Tender documents including instructions to tenderers, tender form, schedules of requirements, specifications, drawings and standard conditions of contract can be obtained from the Commercial Secretary, Supply & Stores Department, Office of the High Commissioner for Pakistan in U.K., 40, Lowndes Square, London, S.W.1, on payment of £5 (Five pounds) for each set which amount will not be refunded. Tenders in sealed covers superscribed "Tender for Rails 90 lbs. 'R' and Rail Fittings" should be submitted direct to the Director General, Railways, Ministry of Communications, Railway Division, Government of Pakistan, Karachi, so as to reach him before 11.00 hours on 26th February, 1952. Tenders will be opened in the office of the Director, Mechanical Engineering and Stores, Railway Division, at 11.00 hours on 27th February, 1952, in the presence of any tenderers who may care to be present. The Diector General, Railways, reserves to himself the right to reject the lowest or any tender without assigning any reason therefor and may accept any tender in part. This call is being made simultaneously in Pakistan, U.K., France, Belgium, West Germany, U.S.A., Canada and India.

GRADUATE Electrical Engineers required to be trained as Designers of electrical equipment for diesel-electric locomotives. Practical workshop experience of manufacture and testing of this equipment preferred, together with good Honours Degree in Electrical Engineering. Age range 25-30 years. Good salary, prospects and facilities for advanced technical education. Excellent working conditions. Please reply in confidence to Box 351, *The Railway Gazette*, 33, Tothill Street, London, S.W.1.

PERUVIAN CORPORATION LIMITED. Required for the Southern Railway of Peru Sub-Accountant with some years' experience of railway accountancy and preferably with a knowledge of the Spanish language. Three years' Contract, renewable, liberal leave, passages paid. Apply to the Secretary, PERUVIAN CORPORATION LIMITED, 144, Leadenhall Street, London, E.C.3.

GOVERNMENT OF PAKISTAN

APPLICATIONS are invited for three posts of Divisional/District Mechanical Engineer in the Motive Power and Mechanical Engineering Departments of the Pakistan Railway Service of Engineers. On contract for three years. Pay Rs.600-40-1,000-1,050/2-1,150 plus Rs.50/- as technical pay to be determined according to qualifications and experience plus £30 per month overseas pay for a candidate of non-Asiatic domicile with free passage (for self only) to Pakistan on appointment and from Pakistan on termination of contract. Leave. Duties: Operation, maintenance and repair of locomotives and other rolling stock. Qualifications: Pass in Sections A, B & C of A.M.I.Mech.E. (London); at least two years training in various locomotive shops and drawing offices; at least eight years subsequent experience in mechanical and/or motive power department of a railway on the operating, repairs, maintenance and servicing of locomotives; experience in loco shed organisation and schedule repairs and servicing; at least five years experience in a supervisory post. Candidates with experience of Pakistan or Indian Railways preferred. Age not more than 52 years. Application, on the form to be obtained on request, should be made to the HIGH COMMISSIONER FOR PAKISTAN, 35, Lowndes Square, London, S.W.1. Closing date for the receipt of completed applications—30th January, 1952.

JUNIOR CIVIL ENGINEER required for maintenance and general construction work on the Central Railway of Peru (a mountain railway); residence would be at an altitude of 12,000 feet. Single man of about 24 to 26 years of age preferred. Railway experience and/or knowledge of Spanish desirable but not essential. Apply to the Secretary of THE PERUVIAN CORPORATION LTD., 144, Leadenhall Street, London, E.C.3.

WE buy used or unserviceable Steel Files at good prices on lots of 2 cwt. or more.—THOS. W. WARD LTD., Reusable Steel Dept., Albion Works, Sheffield.

BOUND VOLUMES.—We can arrange for readers' copies to be bound in full cloth at a charge of 25s. per volume, post free. Send your copies to the SUBSCRIPTION DEPARTMENT, Tothill Press Limited, 33, Tothill Street, London, S.W.1.

CENTRE LATHE 11" × 10' between centres fully motorised as new condition; New Union G.15 12" Double Ended Grinder, motorised 400V 3Ph 50cc; Swiss Ruti Capstan 1¼" dia. bar through spindle, motorised 400V 3Ph 50cc; Heavy Duty Crankshaft Grinder 13" Height of centres 52" between, motorised; Robey Smith Gear Cutter up to 1½" cap motorised 400V 3Ph 50cc; Smith and Coventry Vertical Miller 56" × 14" table; Planing Machine 60" × 20", 24" between the uprights; New Velox 6" Hacksaw motorised 400V 3Ph 50cc; Large Quantity of Belco 14" 4-Jaw Heavy Independent Chuck; Cleveland 6½" Spindle Automatic. All the above machines are available for immediate delivery, subject to prior sale. Enquiries will be dealt with promptly. Apply MODERN MACHINE TOOLS LIMITED, Maudslay Road, Coventry.

DRAUGHTSMEN required. 5-day week. Pension Scheme in operation. Apply GLOUCESTER RAILWAY CARRIAGE & WAGON COMPANY, Gloucester.

RELIABLE man seeks employment, 25 years practical and commercial experience in the repairing and building of wood and steel railway wagons of all types. Also experienced in the handling of labour and the care and maintenance of machinery and tools.—Box 344, *The Railway Gazette*, 33, Tothill Street, London, W.C.1.

LOCOMOTIVE, Carriage and Wagon Senior Draughtsman, 30/35 years of age. Qualifications: Must have served a full general apprenticeship in an engineering workshop (preferably railway) and have had at least five years Drawing Office experience with some time in an executive capacity. A knowledge of Spanish an advantage. Future prospects. Apply to the Secretary, PERUVIAN CORPORATION LTD., 144, Leadenhall Street, London, E.C.3.

JUST PUBLISHED.—Twenty-Five Years of the North Eastern Railway, 1898-1922. By R. Bell, C.B.E., Assistant General Manager, N.E.R. and L.N.E.R. Companies, 1922-1943. Full cloth. Cr. 8vo. 87 pages. 10s. 6d.—*The Railway Gazette*, 33, Tothill Street, London, S.W.1.

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that the winning team be given a sight-seeing trip to France this summer, where it is hoped they will also visit French National Railways locomotive depots. The runners-up also will receive awards.

**Antofagasta (Chili) & Bolivia Railway Co. Ltd.**—The directors of the Antofagasta (Chili) & Bolivia Railway Co. Ltd. have decided to pay, on account of arrears, a dividend of 2½ per cent., less income tax, on the 5 per cent. cumulative preference stock.

**Mont Blanc Road Tunnel.**—The French Government has decided to make a beginning this year on the Mont Blanc road tunnel. The French Parliament has passed a law creating a road investment fund, to be financed by a 20 per cent. tax on petrol. Among the first public works to benefit by the fund will be the Mont Blanc tunnel scheme.

**Jonas Woodhead & Sons Ltd.**—The directors of Jonas Woodhead & Sons Ltd. recommend a dividend on the ordinary shares for the year to September 30 last of 15 per cent. For the previous year a dividend of 10 per cent. and a bonus of 5 per cent. were paid. Group profit, after charging £87,221, against £35,581, for taxation, amounted to £80,557, against £53,172. The amount attributable to members of the holding company was £80,296, as compared with £52,898.

**Cheaper Evening Air Fare to Paris.**—A £10 10s. night excursion return fare is to be introduced on the London-Paris route by British European Airways and Air France in April. This fare, £1 10s. lower than the present off-peak rate, will apply to journeys between 11 p.m. and 7.15 a.m. The revised summer return fare for journeys between 9 a.m. and 7 p.m. will be £15 19s., against £15 6s. the present full rate. During the evening from seven to nine and early morning from 7.15 to nine an excursion rate of £12 15s. will apply. It will also be possible to travel by night to Nice and back for £25, the excursion rate last year, on Monday, Tuesday and Wednesday nights. On other nights the fare will be £28, against the normal rate of £38 14s.

**Manila Railway.**—Adjourned meetings of holders of 3½ per cent. "B" debenture and of 4 per cent. "A" debenture of the Manila Railway Company (1906) will be held at Winchester House, London, E.C., on February 4, to authorise extension of the moratorium begun in 1943 until January 14, 1953.

**Argentine Steam Locomotives.**—Construction of metre-gauge steam locomotives for the Argentine National Railways has begun in the Rosario Workshops with an eight-coupled mixed-traffic type weighing 63 tons *plus* 42 tons for the tender. The first one is reported to have hauled a 2,000-*tonne* freight train at 35 m.p.h.

**Santa Fe Uranium.**—The Atchison, Topeka & Santa Fe Railroad has formed a new corporation named the Haystack Mountain Development Company to mine uranium ore discovered recently on property owned by the railway near Grants, New Mexico. All the stock is owned by the A.T.S.F., and the Haystack company is negotiating with Anaconda for the sale and delivery of the ore.

**Silentbloc Limited.**—The directors of Silentbloc Limited have declared an interim dividend of 3d. per 2s. share or 12½ per cent. in respect of the year ended May 31 last on the capital as increased by a 50 per cent. share bonus in September. Last year the final dividend was 16⅔ per cent. to make a total of 29$\frac{1}{16}$ per cent. The payment of the interim dividend on the increased capital at the same rate does not necessarily mean that the total distribution will exceed that in respect of the year ended May 31 last.

**Chilean Rolling Stock.**—The first all-steel third class coaches to be made throughout in Chile are now being turned out at the rate of one a month by the S.A. Heiremans de Constr. Metalicas, of Santiago, for the broad-gauge sections of the Chilean State Railways.

**Forty-Five Years of Service.**—Mr. Harold Haynes has recently retired, after 45 years of railway service, from the Public Relations & Publicity Department of the London Midland Region, British Railways. Mr. Haynes supervised special decorations at stations and displays at agricultural shows and exhibitions throughout the Region. One of his last jobs was helping in the decoration of Euston Station when Princess Elizabeth and the Duke of Edinburgh returned from their tour of Canada. Mr. George Dow, Public Relations & Publicity Officer, recently presented Mr. Haynes with a clock on behalf of the staff.

**Special Trains for Rugby International.**—Over 30 special trains were run by the Scottish Region of British Railways in connection with the international rugby match between Scotland and France at Murrayfield on January 12. Many of the specials took their passengers direct to Edinburgh suburban stations adjacent to Murrayfield.

**British Railways Coal and Steel Carryings.**—British Railways weekend coal carryings from deep-mined pits and opencast sites amounted to 401,430 tons, which was an increase of over 21,000 tons on the previous weekend, the total for the week

being 3,198,350. The latest figures for iron and steel show that the total conveyed from the principal steelworks during the week ended January 5 was 156,813 tons.

**Generous Donation by Broad Street Staff.**—Members of the Broad Street Goods Depot staff, London Midland Region, have subscribed £130 towards the maintenance of the widows and dependants of the three members of the London Fire Brigade who lost their lives in the fire at the depot on December 21. The Chief Officer of the London Fire Brigade in acknowledging the donation has expressed appreciation of this very generous donation.

## Forthcoming Meetings

January 18 (*Fri.*).—Royal Dublin Society, Balls Bridge, Dublin, at 3 p.m. "To the Clouds by Train — Railway Engineering in the Bernese Oberland," by Mr. Cecil J. Allen.

January 19 (*Sat.*). — Permanent Way Institution, Manchester & Liverpool Section, in the Liverpool Technical College, Byrom Street, Liverpool, at 2.30 p.m. "Maintenance and Renewal of Track in Tropical Africa," by Mr. F. Humberstone.

January 21 (*Mon.*).—Institution of Electrical Engineers, Savoy Place, London, W.C.2, at 5.30 p.m. Discussion on "The Implications of the Railway Electrification Committee's Report, 1950," to be opened by Mr. C. M. Cock, General Manager, Traction Department, the English Electric Co. Ltd.

January 21 (*Mon.*).—Institute of Transport, Visual Aids Study Group, at 80, Portland Place, W.1, at 5.45 p.m. Programme will include three films: "Absolute Block Signalling," "Berth 24," and "First Principles of the Petrol Engine."

January 23 (*Wed.*).—British Railways, Southern Region, Lecture & Debating Society, at the Chapter House, St. Thomas' Street, S.E.1, at 5.45 p.m. Belgian travel films, presented by Mr. A. Mertz, London Manager, Belgian National Railways & Marine.

January 23 (*Wed.*).—Railway Students' Association, joint meeting with the Western Region London Lecture & Debating Society, at the London School of Economics & Political Science, Houghton Street, Aldwych, W.C. 2, at 6 p.m. Debate: "That Rail Transport for Freight and Parcels Traffic should be confined to long distance and large bulk traffic, leaving short distance and lighter traffic to be carried by road."

January 24 (*Thu.*). — Road Haulage Association, National Council Meeting, at Church House, Westminster, S.W.1, at 10.30 a.m.

January 26 (*Sat.*).—British Railways, Southern Region, Lecture & Debating Society. Visit to British Railways' Police College, Tadworth.

January 26 (*Sat.*).—Railway Students' Association. Inspection of platform and parcels work, and signalbox at Liverpool Street.

January 26 (*Sat.*).—Permanent Way Institution, Annual Winter Meeting, at the Institution of Civil Engineers, Great George Street, Westminster, S.W.1, at 2.30 p.m. Annual Winter Dinner, at the Railway Executive Headquarters, 222, Marylebone Road, N.W.1, at 5.45 for 6.15 p.m.

# Railway Stock Market

Markets have remained cautious and uncertain, mainly because it is realised that important decisions will be made by the Conference of Commonwealth Finance Ministers to stop the drain on sterling area gold and dollar reserves. Moreover it is also expected that early next month the Government will announce further plans for the checking of inflation at home.

Uncertainty how E.P.T. will be calculated is also an unsettling influence; and it is still expected that E.P.T. details will not be announced until the Budget. In fact the view is now widely held that it will not be possible to assess the market and investment outlook until April. This week industrial shares have been inclined to lose ground, but on the other hand, commodity shares have been in demand, notably tin mining and other base metal shares, because it is assumed that metal prices are more likely to rise further than fall in the future. Whereas home industrials have been uncertain, there has been rather better demand for overseas securities, which has benefited foreign rails to some extent.

British Funds were inclined to strengthen because it is assumed that the gilt-edged market should benefit and the drain in gold and dollar reserves is stemmed. Also it is pointed out that at current levels Gilt-edged still offer apparently attractive yields, and that this will bring in buyers, if, as is now being widely assumed, there is to be no further increase in the Bank rate. War Loan 3½ per cent. at its current level of nearly 80¾ yields almost 4⅜ per cent. and the yield on some leading industrial shares is not much above this. Consequently it is being argued that either British Funds are too low in price or some industrials too high, unless there are prospects of higher dividends on the latter, and in any case E.P.T., it would seem, will leave little scope for this.

Canadian Pacific remained active, though at $72xd have not held best levels. There has been a revival of strong U.S. buying of Canadian stocks which partly accounts for the activity in Canadian Pacifics. The 4 per cent. debentures and 4 per cent. preference stocks have been steady and inclined to attract more buyers. Antofagasta continued active, helped by the further payment in respect of preference dividend arrears. The ordinary changed hands around 18¼ and the preference around 73. Leopoldina stocks remained firmly held and the ordinary and preference both strengthened on estimates of their total "pay-outs." Many holders bought below existing prices, but are generally retaining their stocks for the final pay-outs. At the time of writing, the ordinary has moved up to 11½ and the preference to 29. The 6½ per cent. debentures were 151¼. Leopoldina Terminal 5 per cent. debentures were 108 and the ordinary units 1s. 9d. San Paulo 10s. units eased to 15s. 3d. in line with the general trend in Brazilian securities which were affected by the latest regulations which will mean a cut in remittances from British-owned companies there. In other directions Manila "A" debentures were 74 and the preference shares 7s. 3d. Mexican securities have been prominent, but best levels were not fully held. Mexican Central "A" debentures were active up to 87, but later eased to 86 on profit-taking. Nitrate Rails were 23s. 6d. and Taltal 18s. 10½d. United of Havana stocks were sold; the 1906 debentures receded to 18¼.

**Road** transport shares recorded few movements. Southdown were 96s., West Riding 42s., and Lancashire Transport 53s. 9d. B.E.T. deferred stock came back to £425.

Engineering and kindred shares were generally easier owing to the steel position. Guest Keen came back to 51s. 6d., Vickers were 44s. 10½d., John Brown 45s. 7½d., Renold Chain 58s. 9d., and Ruston & Hornsby 32s. 6d. T. W. Ward were 71s. 9d. and Babcock & Wilcox at 69s. 9d. regained part of an earlier decline. Shares prominent in rearmament work participated in the downtrend because it is realised that E.P.T. will leave little scope for higher dividends. On the other hand, dividends should be maintained, and on this basis, yields in many cases are attractive.

Among shares of locomotive builders and engineers, Beyer Peacock were 32s. 4½d., North British Locomotive 16s. 6d., Gloucester Wagon 13s. 9d., Vulcan Foundry 23s. 1½d., James Nelson 56s. 6d., and Birmingham Carriage 34s. 9d. Charles Roberts were 22s. and Wagon Repairs 5s. shares 10s. 3d.

## Traffic Tab'e of Overseas and Foreign Railways

| | Railway | Miles open | Week ended | Traffics for week: Total this year | Traffics for week: Inc. or dec. compared with 1949/50 | No. of week | Aggregate traffics to date: Total 1950/51 | Aggregate traffics to date: Increase or decrease |
|---|---|---|---|---|---|---|---|---|
| South & Cen. America | Antofagasta ... | 811 | 4.1.52 | £ 139,100 | + £ 62,340 | 1 | £ 62,470 | — £ 14,290‡ |
| | Costa Rica ... | 281 | Nov., 1951 | c1,000,104 | + c63,898 | 22 | c5,947,406 | + c650,137 |
| | Dorada ... ... | 70 | Nov., 1951 | 33,765 | — 3,207 | 48 | 394,882 | — 33,323 |
| | Inter. Cel. Amer. ... | 794 | Nov., 1951 | $1,039,455 | — $19,932 | 48 | $11,978,007 | — $282,812 |
| | Paraguay Cent. ... | 274 | 28.12.51 | £289,547 | + £102,688 | 26 | £8,823,911 | + £3,556,978 |
| | Peru Corp. ... | 1,050 | Dec., 1951 | $8,471,000 | + $1,124,000 | 26 | $49,271,000 | + $3,141,000 |
| | " (Bolivian Section) | 66 | Dec., 1951 | Bs.19,282,000 | + Bs.5,954,000 | 26 | Bs.95,087,000 | + Bs.25,173,000 |
| | Salvador ... ... | 100 | Oct., 1951 | c114,000 | + c27,000 | 18 | c495,000 | + c140,000 |
| | Taltal ... ... | 147 | Dec., 1951 | $2,157,000 | + $721,900 | 26 | $12,277,000 | + $3,020,200 |
| Canada | Canadian National† | 23,473 | Nov., 1951 | 18,035,000 | + 403,000 | 48 | 190,178,000 | + 22,295,000 |
| | Canadian Pacific† ... | 17,037 | Nov., 1951 | 12,638,000 | + 938,000 | 48 | 131,106,000 | + 16,187,000 |
| Various | Barsi Light* ... | 167 | Nov., 1951 | 37,957 | + 6,607 | 33 | 284,050 | + 48,667 |
| | Egyptian Delta ... | 607 | 10.4.51 | 17,513 | — 267 | 4 | 17,513 | — 267 |
| | Gold Coast ... | 536 | Nov., 1951 | 347,307 | + 38,503 | 34 | 2,095,480 | + 135,872 |
| | Mid. of W. Australia | 277 | Oct., 1951 | 72,767 | + 30,311 | 18 | 242,663 | + 89,350 |
| | South Africa ... | 13,398 | 15.12.51 | 2,067,315 | + 249,559 | 37 | 71,102,018 | + 7,769,619 |
| | Victoria ... ... | 4,744 | Sep., 1951 | 1,809,949 | + 80,605 | 13 | — | — |

* Receipts are calculated at 1s. 6d. to the rupee † Calculated at $3 to £1
‡ Aggregate receipts for four days, compared with seven days in 1951